MEDICAL LIBRARY

Illinois Medical Journal

OWNED AND PUBLISHED BY THE MEDICAL PROFESSION OF ILLINOIS
Office of Publication 715 Lake Street, Oak Park, Illinois

Vol. 68, NO. 2 OAK PARK, ILL., AUGUST, 1935 $3.00 a Year

CONTENTS:

Editorials (For Titles See Extended Table of Contents) 97

ORIGINAL ARTICLES

Surgery re Diseases of the Thyroid. *Martin Nordland, M. D., Minneapolis, Minn.*..... 117
Reconstruction of the Hip. *Frederick G. Dyas, M. D., Chicago*..... 124
Intermittent Gastric Obstruction Following Cholecystectomy. *Clifford U. Collins, M. D., Peoria, Ill.* 127
Primary Urethral Calculi. *Norris J. Heckel, M. D. and Robert E. Johannesen, M. D., Chicago* 130
Herpes Zoster. *Frank Garm Norbury, M. D., Jacksonville, Ill.* 134
Removal of Superfluous Hair by Multiple Electrolysis. *Wm. A. Rosenberg, M. D., Chicago*.. 138
Observations on the Public Health Outlook. *Frank J. Jirka, M. D., Springfield, Ill.*..... 140
Roentgenology of the Alimentary Tract. *M. J. Hubeny, M. D., Chicago*..... 143
Backache in Women. *Samuel J. Lang, M. D., Evanston, Ill.* 147
Muscular Asthenopia. *R. H. Woods, M. D., La Salle, Ill.* 150
Eye and Ear Reflexes Caused by Dental Pathology. *Joseph Shanks, M. D., Chicago*..... 152
Symptoms and Diagnosis of Coronary Occlusion. *James G. Carr, M. D., Evanston, Ill.*..... 155

(Continued on Page 6)

Entered as Secon-class Matter July 21, 1919, at the Post Office, Oak Park, Illinois, under the Act of March 8, 1879. Acceptance for mailing at special rate of postage for in Section 1102, Act of October 8, 1917, authorized July 15, 1918.

"The *Advertising Pages* have a *Service Value* for the *READER* that no *truly Progressive* Physician can *afford to overlook.*"

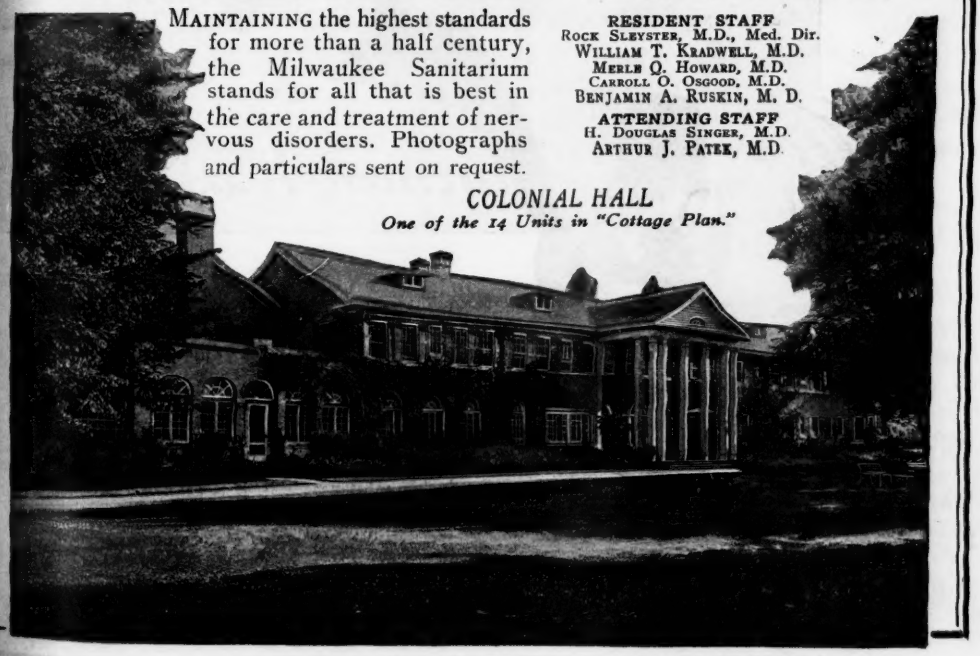
MILWAUKEE SANITARIUM, Wauwatosa, Wis.

For NERVOUS DISORDERS (Chicago Office—1823 Marshall Field Annex Wednesdays, 1-3 P. M.) Central 1162.

MAINTAINING the highest standards for more than a half century, the Milwaukee Sanitarium stands for all that is best in the care and treatment of nervous disorders. Photographs and particulars sent on request.

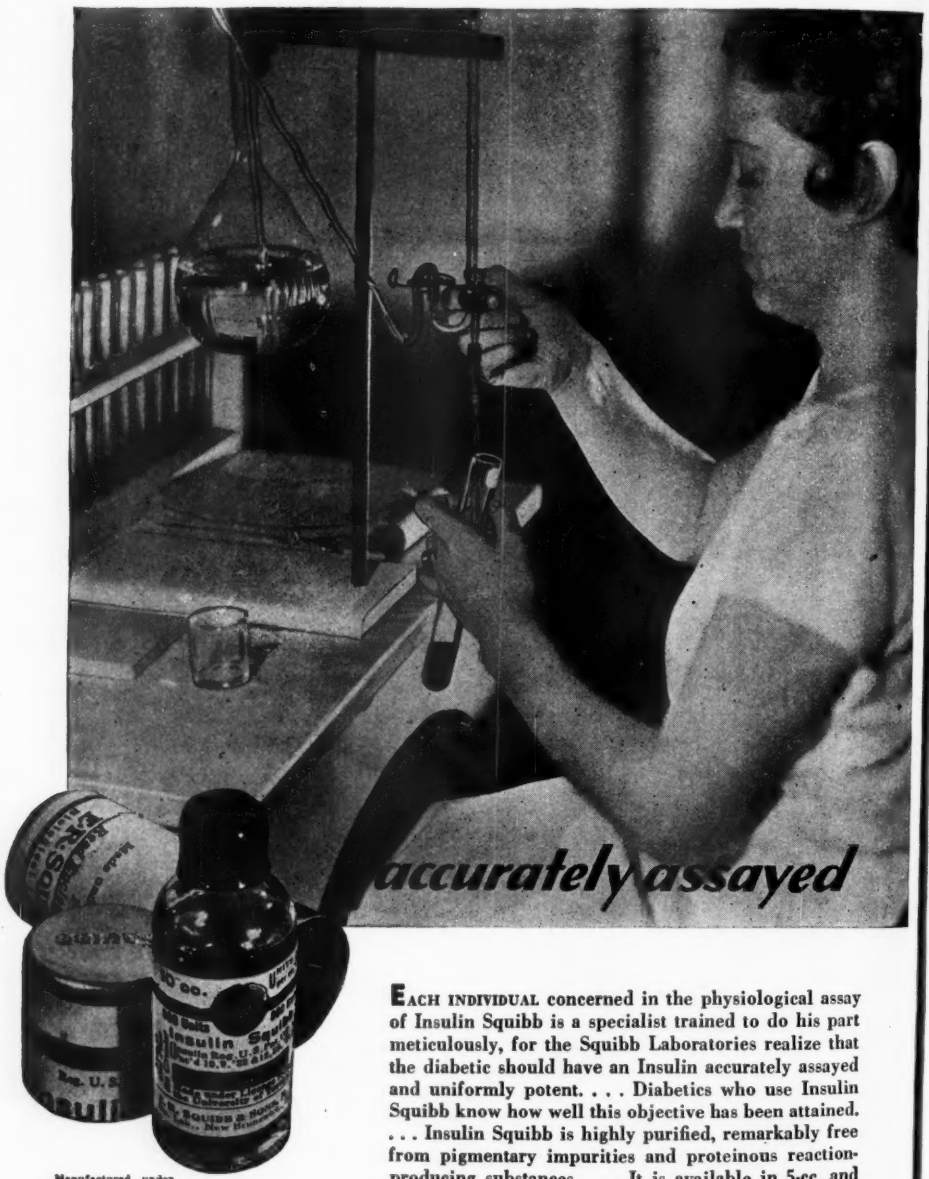
RESIDENT STAFF
ROCK SLEYSTER, M.D., Med. Dir.
WILLIAM T. KRADWELL, M.D.
MERLE Q. HOWARD, M.D.
CARROLL O. OSGOOD, M.D.
BENJAMIN A. RUSKIN, M. D.

ATTENDING STAFF
H. DOUGLAS SINGER, M.D.
ARTHUR J. PATEK, M.D.



COLONIAL HALL
One of the 14 Units in "Cottage Plan."

INSULIN SQUIBB



Manufactured under license from the University of Toronto

EACH INDIVIDUAL concerned in the physiological assay of Insulin Squibb is a specialist trained to do his part meticulously, for the Squibb Laboratories realize that the diabetic should have an Insulin accurately assayed and uniformly potent. . . . Diabetics who use Insulin Squibb know how well this objective has been attained. . . . Insulin Squibb is highly purified, remarkably free from pigmentary impurities and proteinous reaction-producing substances. . . . It is available in 5-cc. and 10-cc. vials in the usual "strengths."

E·R·SQUIBB & SONS, NEW YORK
MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858

A SQUIBB GLANDULAR PRODUCT

ILLINOIS MEDICAL JOURNAL

THE OFFICIAL ORGAN OF

THE ILLINOIS STATE MEDICAL SOCIETY

VOL. 68 — OAK PARK, ILL., August, 1935 — No. 2

ILLINOIS MEDICAL JOURNAL

Published monthly by the Illinois State Medical Society under the direction of the Publication Committee of the Council.

GENERAL OFFICERS, 1935-1936

PRESIDENT.....CHARLES B. REED, Chicago
PRESIDENT-ELECT.....ROLLAND L. GREEN, Peoria
1ST VICE-PRESIDENT.....T. H. CULHANE, Rockford
2ND VICE-PRESIDENT.....F. H. MULLER, Chicago
SECRETARY.....HAROLD M. CAMP, Monmouth
TREASURER.....A. J. MARKLEY, Belvidere

THE COUNCIL

E. H. Weld,	1st District, Rockford	1938
E. C. Cook,	2nd District, Mendota	1938
R. K. Packard	3rd District, Chicago	1938
J. S. Nagel,	3rd District, Chicago	1937
L. E. Day,	3rd District, Chicago	1936
E. P. Coleman,	4th District, Canton	1937
S. E. Munson,	5th District, Springfield	1937
T. B. Knox,	6th District, Quincy	1936
I. H. Neece,	7th District, Decatur	1937
C. E. Wilkinson,	8th District, Danville	1937
Andy Hall,	9th District, Mt. Vernon	1936
J. S. Templeton,	10th District, Pinckneyville	1936
Edw. S. Hamilton,	11th District, Kankakee	1938

Chairman of Council, I. H. Neece

EDITOR
CHARLES J. WHALEN.....25 E. Washington St., Chicago

GENERAL COUNSEL
EDWIN W. RAWLINS.....77 West Washington St., Chicago

LEGISLATIVE COMMITTEE
JOHN R. NEAL, *Chairman*.....Springfield

MEDICO-LEGAL COMMITTEE
J. R. BALLINGER, *Chairman*.....2724 W. North Ave., Chicago
R. O. HAWTHORNE, *Secretary*.....Kankakee

EDUCATION COMMITTEE
MISS JEAN MCARTHUR, *Secretary*.185 N. Wabash Ave., Chicago

PERMANENT HISTORIAN
IRVING S. CUTTER.....301 East Chicago Ave., Chicago

SCIENTIFIC SERVICE COMMITTEE
ROBERT S. BERGHOFF, *Chairman*...30 N. Michigan Ave., Chicago
HAROLD M. CAMP, *Secretary*.....Monmouth

PUBLICATION COMMITTEE
HARRY J. STEWART, *Secretary*.....715 Lake St., Oak Park

Outside of editorial or allied views or statements that are the authoritative actions of the Illinois State Medical Society, the organization denies responsibility for opinions and statements published in the ILLINOIS MEDICAL JOURNAL. Views expressed by the various authors and views set forth in various departments in the JOURNAL represent the views of the writers.

State Society will pay no bills for legal services except those contracted by the Committee. Notify the Chairman at once. Do not employ attorneys.

Send original article, advertising copy, cuts and all communications relating to advertising to Dr. Charles J. Whalen, c/o ILLINOIS MEDICAL JOURNAL, 185 N. Wabash Ave., Chicago.

Membership correspondence to Dr. Harold M. Camp, Monmouth, Ill.

Society proceedings and news items and changes in the mailing list to Dr. Henry G. Ohls, Managing Editor, 1618 Juneway Terrace, Chicago.

Contributors will submit all copy for publication typewritten on standard size paper and double spaced. Copy not complying with this rule will be returned, if convenient.

Subscription price of this JOURNAL to persons not members of the Illinois State Medical Society is $3.00 per year, in advance, postage prepaid, for the United States, Cuba, Porto Rico, Philippine Islands, Hawaiian Islands and Mexico. $4.00 per year for all foreign countries included in the postal union. Canada, $3.50. Single current copies, 50 cents.

Editorials

VITAMIN E DEFICIENCY AS A CAUSE OF STERILITY AND ABORTION

Lewis, in a discussion of the relation of vitamins to obstetrics[1] very interestingly points out a number of important reasons that make for general avitaminosis. Thus, he quotes Sherman[2] and Brown and Tisdall[3] as indicating that one-third of the average American diet consists of combinations, mainly from cereal sources, particularly flour; in the process of the manufacture of which, modern methods of refinement exclude practically all of the vitamins, which are discarded. This gives one-third of the diet essentially devoid of vitamins. Of the remaining two-thirds, meats form a fairly large percentage, which is a food source practically lacking in vitamins, owing to our selection of steaks, roasts and chops, or muscle meats, which are not the repository of vitamins in the animal body. Sugar is used extensively in the manufacture and preparation of food and its refinement likewise eliminates vitamins. Pasteurization of milk destroys over one-third of the vitamin B complex, according to Dutcher.[4] Plimmer and Plimmer,[5] in their book "Food, Health, Vitamins" indicate that from many countries data of all kinds show clearly that cancer and diabetes are increasing all over the world, and that at the same time there is a corresponding increase in the consumption of white cereals and of sugar. The Plimmers do not consider this direct evidence, but merely a suggestion which hints at a connection between a starch and sugar diet and cancer; and this takes on a new significance in the light of the experiments reported by Davidson, in which he appears to have shown that vitamin E prevents the development of tar carcinoma in experimental white mice.[6, 7]

In the world of animal nutrition, Ewing[8] comments on the startling situation involving the absence of vitamin E from many rations furnished livestock, and the tremendously high incidence of "slips," as abortion is designated in

animal husbandry, is now being traced to an unsuspected deficiency which frequently amounts to a complete absence of vitamin E.

A recent article on the importance of vitamin E disclosed vitamin E deficiency in 181 samples of breast milk collected from 187 mothers; and cow's milk is definitely known to be deficient in this reproductive factor.[9] Balfour and Talpade[10] have shown that in Southern India, where milled rice is the staple diet, nearly all of the females are in a state of avitaminosis, the incidence of premature births and stillbirths being three times greater than it is in Northern India, where *whole* wheat is the staple diet. Incidentally, the infant mortality is in about the same proportion and is thought to be due to the same cause.

Vogt-Moller[11] has written several articles giving practical results in the use of wheat germ and wheat germ oil, his latest contribution involving a series of 20 cases of habitual abortion treated with wheat germ oil. Seventeen of the patients produced living children. There were five cases of women with primary sterility, of which two produced living children on similar treatment.

Recently, at the Atlantic City Session of the Canadian and American Medical Associations, Dr. Earl Watson of the University of Western Ontario, reported on 65 human cases treated with wheat germ oil, and while he was successful occasionally in correcting primary sterility, his results were much more impressive in correcting chronic recurrent abortion. This work will soon appear in the *Journal of the Canadian Medical Association.*

There can be hardly any question of the effectiveness of vitamin E in the treatment of nutritional sterility and nutritional abortion in almost every variety of domestic mammal; and these findings have been quite definitely corroborated by Vogt-Moller and more recently, by Earl Watson, in the case of humans. What does not seem to be so obvious is the decided lack of vitamin E as distinguished from its alleged abundance. It is within the memory of every medical practitioner, that vitamin A was heralded as being exceedingly widespread, not only in the matter of variety of foodstuffs but also in the matter of its intensity. Nevertheless, hardly three years have elapsed since nutritionists everywhere acclaimed the widespread prevalence of vitamin A that the medical profession has resorted to the extremely promiscuous use of vitamin A concentrates. Very apparently, the alleged widespreadness of vitamin A either was unreal or insufficient to provide for the vitamin A demands of the American public. With human breast milk and cow's milk deficient in vitamin E, with denatured cereals, blanched sugar, Irish potatoes, and tinned vegetables, and the tinning is stressed because of the definitely destructive action of metals in solution on the vitamin E content of foods, it is far easier to show that America is undergoing an alimentary castration than it is to defend the vaccuous statement that vitamin E is probably not of clinical importance because of its alleged widespreadness in foods. The mistake rests with the nutritionists, who speak about natural foods when they discuss the presence of vitamin E, but appear to overlook that the public is fed very highly industrialized, "refined," vitamin-depleted and definitely denatured comestibles.

As Sure says,[12] "Obstetricians state that at least 6 to 8 per cent. of sterilities cannot be accounted for by diseased conditions in either father or mother. The diet of many people in this country is derived mainly from degerminated cereals, from which vitamin E has been removed in milling. Furthermore, that diet is not supplemented sufficiently by eggs and vegetables.' The burden of proof, according to Sure, that such cases of sterility will not respond to vitamin E administration, is up to the clinician.

BIBLIOGRAPHY

1. Lewis, Llewellyn R.: The Relation of the Vitamins to Obstetrics, A. M. A. Jour. Obstetrics & Gynecology **29**: 759-765, 1935.
2. Sherman, H. C.: Chem. of Food and Nutrition, 1933.
3. Brown, A., and Tisdall, F. F.: Brit. M. J. **1**: 55-57, 1933.
4. Dutcher, R. Adams, Guerrant, N. B. and McKelvey, J. G.: J. Dairy Sc. **17**: 455-466, 1934.
5. Plimmer, R. H. A. and Violet G.: "Food, Health, Vitamins," 1933,
6. Davidson, J. R.: The Canadian Med. Asso. Jour. **32**: April, 1935.
7. Davidson, J. R.: The Canadian Med. Asso. Jour. **32**: April, 1935—Tar Carcinoma.
8. Ewing, P. V.: The Hog Breeder, **10**: 3, 1935.
9. Pacini, August J.: Importance of Vitamin E; Med. Searchlight, **11**: 5, 1935.
10. Balfour, J. M., and Talpade, S. K.: Indian Med. Gazette **67**: 601-606, 1932.
11. Vogt-Moller, P.: Acta obst. et gynec. Scandinav. **13**: 219-227, 1933.
12. Sure, Barnett: The Vitamin, 1933.

ALL ROME NEEDED WAS HEALTH INSURANCE!

"History repeats itself."

Those who are insistent that the burden of high taxes shall become still more engorged through compulsory and fake "health insurance schemes" should pause in their oratory and propaganda sufficiently long to read this extract from "The Conquest of Civilization" by James Henry Breasted, the noted archeologist, written at Armageddon, March 23, 1926.

In this volume, beginning on page 657, Mr. Breasted writes:

"We have seen good government, fine buildings, education and other evidences of civilization more widespread in the second century of peace (69-167 A. D.) than ever before. Nevertheless the great Roman Empire which we have been studying, although in a condition seemingly so favorable was suffering from an inner decay whose symptoms, at first hidden were becoming more and more evident. In the first place the decline of farming, so noticeable before the fall of the Republic (p563ff) had gone steadily on.

(Excerpt from page 564 reads, "The returned soldier . . . if he found his home and little farm uninjured and was willing to settle down and work its fields of old, he was soon aware that the hordes of slaves now cultivating the great plantations or *villas* around him were producing grain so cheaply that when he had sold his harvest he had not received enough for it to enable himself and his family to live. At the same time the markets of Italy were filled with cheap grain from Sicily, Africa, and Egypt. *With this imported grain often given away by the government,* he could not compete.

"Slowly he fell behind: he borrowed money and his debts increased. Forced to sell his little farm at last, he, too, wandered into Rome *where he found thousands upon thousands of his kind, homeless, embittered and DEPENDENT UPON THE STATE FOR FOOD.*"

Again: "he cursed the wealth which had done all this, and wandered up to the great city to look for free grain from the government, to enjoy the games and circuses and to increase the poor class already there."

Returning to page 658 we read in resumption of our opening paragraph:

"In spite of the heavy taxes imposed upon it, land had continued to pass over into the hands of the rich and powerful. The oriental system of confining land ownership to large domains held by the state and a few individuals had also a strong influence . . . Such a great estate was called a villa and the system of villa estates having destroyed the small farmers of Italy was now destroying them in the provinces . . . Unable to compete with the great villas, and finding the burdens of taxes unbearable, most of the small farmers gave up the struggle. Such a man would often enter upon an arrangement which made him the *colonus* of some wealthy villa owner. . . . While not actually slaves neither the coloni nor their children were free to leave or to go where they pleased nor had they any opportunity ever to better their condition nor to own their own lands. . . ."

And again: "Multitudes of the country people, unwilling to become coloni, forsook their fields and turned to the city for relief. . . . As a result the amount of land under cultivation decreased. . . . The scarcity was felt most severely in the great centers of population like Rome where prices had rapidly gone up. Our own generation, afflicted in the same way, is not the first to complain of 'the high cost of living.' . . . The country people who removed to Rome were only bringing about their own extermination as a class. The large families which country life favors were no longer reared, the numbers of marriages shrank and the population of the Empire shrank. . . . Debased by the life of the city, the former sturdy yeoman lost his independence in an eager scramble for a place in the waiting line of city poor, to *whom the government distributed free wine, grain and meat.* The time which should have been spent in bread-winning was worse than wasted among the cheering multitudes at the chariot races, bloody games and barbarous spectacles. Notwithstanding the fine families who moved to Rome from the provinces under the liberal emperors of the second century A. D., the city became a great hive of shiftless population supported by the state with money which the struggling agriculturist was supposed to provide."

Who can deny but that this picture of the latter days of Rome is foreign to current ken?

Yet even in those days the doctor was a king and not a pawn of the state and state taxation!

OUR ONE HUNDRED PER CENT EFFICIENT LEGISLATIVE SERVICE

Elsewhere in this issue is published the final report of the Legislative Committee of the Illinois State Medical Society. The report is complete and deserves your careful reading and digestion.

The legislative committee had an unusual number of measures to engage its attention during the session just closed. Nearly two thousand bills were introduced into the legislative hopper and more than one hundred of the proposed laws were of a positive or semi-positive medical nature. While special attention was centered on the strictly medical bills it was also necessary to study all of the two thousand proposed laws and ascertain whether or not they pertain to medical practice in its many ramifications. Every bill on the calendar had to be watched carefully from day to day and progress carefully noted.

Every measure of a controversial medical nature that was before the General Assembly was defeated and every measure of a medical nature approved by our legislative committee was passed.

Dr. John R. Neal, chairman of the legislative committee of the Illinois State Medical Society, was constantly on the job at Springfield watching all legislation. The chairman of our legislative committee reported day to day progress to the officers of county societies and key men throughout the state and the co-operation of the lay groups who did their work so effectively was the deciding factor in bringing about the defeat of vicious medical legislation at the 1935 session of the Illinois Legislature.

All of which goes to show that in union there is strength and that with a united medical profession nothing is impossible of achievement.

ORGANIZED MEDICINE IN ILLINOIS IS GIVING UNAPPROACHABLE LEGISLATIVE AND ECONOMIC SERVICE

Organized medicine, as vested in your county and state society provides the staunchest of economic and professional protection.

This unapproachable economic and legislative service to the thousands of physicians in Illinois is so conspicuous and far-reaching and so apparent that the well versed physician wonders what in the world justification there is on the part of certain physicians to claim that no economic service is offered or given by organized medicine in Illinois or elsewhere.

In the face of such false and misleading statements it is well to epitomize briefly some of the unconscious benefits that have accrued to the profession from the various officers and specific committees of the respective county medical societies and the Illinois State Medical Society and that have, so to speak, continued "to toil upwards in the night."

Organized medicine, as vested in your county and state society, provides the staunchest of economic and professional protection.

This is done at a minimum price. Organized medicine gives the members of its accredited societies, the maximum of efficient service, at a cost that is almost picayunish. This is quite in line with the ratio of skill and science versus financial return with which the profession serves the public. And all of this is in juxtaposition with what the various cults and isms levy upon the members of their numerous organizations. For instance chiropractors in Illinois pay annual dues of $120 per capita, merely as a starter, for the upkeep of their organization. Further, special assessments up to the sum of $500 are frequently the order of the day.

As a result of foresight and hard work, the organized profession of the state prevented the enactment of the notorious Sheppard-Towner Bill, ten years ago, in so far as the State of Illinois is concerned. At its recurrence for consideration eight years ago, this bill was again repelled as it never reached a vote. Again six years ago, so influential had the organized profession become that its sponsors held that "discretion was the better part of valor" and after due deliberation, did not re-introduce their bill.

There were only five states with sufficient foresight to turn down this nefarious legislation. Illinois can take pride in being one of the five. The five states are Connecticut, Illinois, Kansas, Maine and Massachusetts. Again ten years ago, in the Illinois General Assembly, nearly fifty bills of a detrimental medical nature were introduced. Not one was written on the Statute books. Again three years ago, in the Illinois

General Assembly, over one hundred bills of a detrimental medical nature were introduced. Not one was written on the Statute books.

No other state in the Union can show a better record. It stands for *pre-eminent organization service to membership.*

For twenty years the organized profession of the state has kept watch and ward over the interests of the profession. From the perfection of the Medical Practice Act in 1923 to the present day, continuous service has been given the physicians of the state of Illinois by their state and county organizations. During the past twenty years the fight has included the overthrow of some almost incredibly favorable laws for quacks and charlatans. No other state has been so successful in such prevention of vicious medical legislation. Illinois comes nearer than any other state in the Union of possessing one standard for entrance into the practice of medicine. Illinois is not afflicted with special boards, conditions and the like, by which the inept traffic in human life, nor are its ethical doctors humiliated by having to sit on the same boards with quacks, and representatives of vicious cults.

Referring again to the Medical Practice Act in Illinois, it is one of the most capable pieces of legislation of that nature in existence. Furthermore, the Supreme Court has upheld its validity, not once but *on four separate occasions.* This piece of legislation owes its place on the Statute books to the organized medical profession of Illinois. It is a masterpiece and it is the work of organized medicine in the state.

Advisability of a blanket act administered by one board including all branches of human treatment, is self-evident in view of the multiplicity of laws and examining boards in many states. When the proposed measure was pending, endless effort was made by drugless healers to liberalize the act. Through the untiring efforts of officers of the various medical societies of the state, the bill passed in essentially the same form as that in which it was offered.

Many members of the General Assembly are in the real estate business. According to law these must pay a renewal license fee annually. This group sought attachment of a $5.00 renewal fee on the Medical Practice Act. Vigorous opposition by organized medicine, hours of conference with the leaders in that session of the General Assembly enabled doctors to defeat the amendment, and save a great deal of money and needless red tape for the physicians. With about twelve thousand medical men in Illinois, defeat of this amendment approximates a saving of $60,000 annually to these physicians, or practically three quarters of a million dollars since the passage of the act in 1923.

In 1923 the Sheppard-Towner Bill was championed by a large lobby of women of education who waged an intensive campaign for the adoption of the provisions of the Federal Act by the State of Illinois. During the hearing on that bill in Congress in 1921 Illinois was the only state that sent a physician to Washington to oppose the passage of the Federal Maternity law. Despite the able protest of Dr. Charles E. Humiston, then president of the Illinois State Medical Society, who represented us, unfortunately the bill was passed. Every state in the union accepted the act except five, viz., Illinois, Maine, Massachusetts, Kansas and Connecticut. The protest made by Illinois at that time later bore results against federal subsidies of this sort. The Illinois State Medical Society has aided in defeating several hundred pernicious bills in the last six Illinois General Assemblies. Out of the twelve hundred bills introduced at the 1927 session, one hundred twenty-six, or over ten per cent. had either a direct or an indirect bearing on the medical men of our state. In 1925, after a bill curtailing public health departments in the necessary performance of their work had been literally "kissed" through the House and Senate and the governor urged to sign the measure by the League of Medical Freedom, call went out to representatives of the Illinois State Medical Society. After a conference with, and upon the advice of this committtee, the governor vetoed the bill.

Diversion of the tremendous post-bellum lay interest in the practice of medicine with an insistence for participation therein that has verged dangerously towards state medicine and the practice of the profession by lay-persons, has been a problem of organized medicine, with the life saving idea of turning such interest from a force pernicious to the public welfare into an active auxiliary of the recognized medical profession. The medium for dealing with this vital problem has been sought for and found in the educational committee of organized medicine. Through this committee, organized lay-bodies,

especially of women, either club women, or those who had felt the urge of concerted benevolence as vested in war auxiliary work are being shown that the best contribution they can make for public health and infant welfare is to work through organized medicine rather than through organized laymen. This problem, including as it does the tremendous amount of free service given through the endowed clinics of private foundations, touches upon the similar debauching of the province of ethical medicine through the federalization of over sixty per cent. of the hospitals of the country. Government ownership of so large a percentage of hospitalization facilities of the country is of a piece with the noose that has been slipped over the heads of the taxpayers and the profession by such legislation as the Sheppard-Towner bill, and all of which have served as officers for many years of the state society and its components.

THE PASSING OF C. ST. CLAIR DRAKE

Clarence St. Clair Drake, Jacksonville, Ill.; Chicago Homeopathic Medical College, 1891; Chairman of the Section on Preventive Medicine and Public Health of the American Medical Association, 1918-1919, and Member of the House of Delegates in 1920; member of the American Psychiatric Association; statistician for vital statistics, Chicago Health Department, 1895-1909; member, secretary and executive officer of the Illinois State Board of Health 1914-1917; director of public health for Illinois, 1917-1921; educational field director of the American Public Health Association, 1925-1929; since 1929 managing officer of the Jacksonville State Hospital; aged 65; died, June 2, of heart disease.

Because a man of purpose, honor and responsibility always passes on with his work unfinished, Dr. C. St. Clair Drake died far too soon and far too young. His years had been filled with service and the best monument he leaves behind him is the human salvage for whom, by the hundreds, he made living possible and profitable, as well as much of the organization of the Illinois Public Health Service in which C. St. Clair Drake was a potent, enthusiastic factor.

Dr. Drake died June 2, in Springfield, Ill. At the time of his death he was the managing officer of the Jacksonville State Hospital. This post he had held through two different political regimes, although the office was appointive—in itself a significant light upon the man's ability. He was a tried and true friend to many.

In May, 1914, Dr. Drake was appointed executive secretary of the State Board of Health, with which body he served until it was dissolved to make way for the State Department of Public Health in 1917. For this body Dr. Drake drew up the plan of organization. He so well forecasted the functions needed to fulfill the requirements of public health needs that not once since then has there been an actual basic change! Dr. Drake laid the foundation, a foundation so firm that to build upon it has been a joyous, a facile and a profitable task. During the World War, C. St. Clair Drake was State Health Director, meeting with competency and ability all perilous questions of camp sanitation and mass prophylaxis. Then, indeed, was shown in all its many facetedness C. St. Clair Drake's resourcefulness, ability, initiative, self-control, wisdom and keen, clear training. Verily he was a man among men, and, what is perhaps the greatest tribute that can be paid, even to a "man among men," a physician among physicians, dealing as he did with what will undoubtedly be the materia medica of the future—public prophylaxis!

C. St. Clair Drake—*requiescat in pace!*

STERILITY AND THE X-RAYS

Max Huhner, New York (*Journal A. M. A.*, May 18, 1935), warns that perhaps the protection usually given to the genital organs when x-rays are used is not adequate enough and that somewhere there might be a leakage which allows the rays to get at the testicle in spite of such protection. He reports four cases in which the patients had been perfectly fertile before and now have azoospermia, and two doubtful cases in which the patient came on account of sterility and, as far as could be determined, there was no other reason for the azoospermia except a previous application of the x-rays. It must be recognized that different testicles react differently to the influence of the x-rays, some being much more sensitive than others, so that what might be adequate protection in some cases would not be for others. An experienced dermatologist informed the author that he used a heavy piece of rubber for protection and that although he admitted that some of the x-rays might penetrate this rubber sufficiently to develop a film, not enough would penetrate to affect the testicles. However, in discussing the matter with an expert roentgen therapist, he was informed by him that an ordinary piece of rubber was not, in his opinion, adequate protection, and in order to obtain such protection it was necessary to add a lead plate as well as an aluminum plate to the device.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Illinois State Medical Society
E. S. Hamilton, M. D., Chairman
Kankakee, Illinois

C. G. Farnum, M. D.
R. K. Packard, M. D.
J. S. Templeton, M. D.
C. E. Wilkinson, M. D.

H. M. Camp, M. D.
I. H. Neece, M. D.
C. B. Reed, M. D.
C. S. Skaggs, M. D.

Address all letters and communications to the Chairman.

In spite of hot weather and vacations, the interest in this subject continues. As long as the practice of medicine is to continue a private enterprise, just so long must we continue to give thought to the attempts being made by reformers to change the same. They are no respecters of time of year or weather conditions.

With practically all the County Medical Societies taking a vacation from monthly meetings, the number of calls for speakers on this subject have been few. But we must continue our work as soon as the regular meetings start in the Autumn. The Committee do not feel that the message is being carried to the public as rapidly as it should. With the number of service and social clubs in the state, all of which are constantly on the lookout for speakers, we feel that a little more intensive work by the medical men, who are members of the clubs, would result in an opportunity being presented for one of our speakers to present our side of the subject. Any member who can so arrange a date should get in touch with Miss McArthur at the Chicago office and she will be able and glad to procure the speaker. Rotary, Kiwanis, and Lions clubs should offer a fine opportunity for this work.

The adjournment of the Legislature of the state of Illinois occurred on June 30, without the passage of any of the bills proposed and pressed by the cultists. This is the result of the efficient work of the Legislative Committee, under the Chairmanship of Dr. Neal, aided and abetted by the support of the medical profession of Illinois, particularly the key men of each County Society. In view of the organization of the cultists this year and the time, effort and necessarily money expended this should be quite encouraging not alone for the result accomplished but also as an example of what can be accomplished by cooperation of the medical profession under proper leadership.

The chief article of this column this month is by President Charles B. Reed. It gives a history of the fight the Illinois State Medical Society has made against Corporate Practice of Medicine and will in the opinion of the Committee be quite interesting and instructive particularly to those members who have not followed closely the fight of the Society against this menace. When you consider the duration of the fight and the time and money expended by the Society you will understand that results so favorable to organized medicine do not just happen, but are the result of unselfish service by some of its members aided by the proper expenditure of funds.

We hope to have in the next issue of the JOURNAL an article by the Chairman of the Council, Dr. Neece. We trust that these articles will receive the attention they deserve.

E. S. HAMILTON, M. D.,
Chairman.

CORPORATE PRACTICE

CHARLES B. REED, M. D.

The practice of medicine by corporations is an extreme and illegal form of group practice. It is also wholly unethical because it interferes with the free choice of physicians, shifts and diffuses professional responsibility, disturbs the confidential relationship between the doctor and patient and makes the doctor an employe in a technical business under the control of an irresponsible body which is most often composed of laymen.

Medical schools and hospitals have always practiced medicine by using indigent patients for educational purposes on the presumption that permission for such usage is a form of compensation.

In principle this is unfair competition since it utilizes endowments and freedom from taxation and other sources of income to compete with the graduates of their own and other schools

who must obtain the furnishings and equipment by their own efforts.

In reality however no widespread objection can be made to the practice since only a relatively small number of schools and hospitals derive revenue from such sources. In the recent survey made by the Chicago Medical Society it was shown that in three of the large local schools only 2 per cent. of the clinical patients could have paid a private physician.

In the instances where schools and hospitals have taken pay or part pay patients for educational purposes as a means of increasing their income the general prestige of such institutions causes patients to patronize them in large numbers to the material disadvantage of the private practitioner.

This custom grew out of the initiation of a new policy of full time teachers on the ground that these teachers being removed from practice were to be given abundant time for teaching and research.

When these men are employed on salaries for an institution which is making a profit or income on their work their functions as teachers are minimized and their research interfered with.

Corporate practice is advocated ostensibly as a means of reducing the cost of medical care through the multiple increase in patients and the diminished overhead. The actual objective however even in the so-called "not for profit" corporations is to obtain financial returns from personal services rendered by hired members of a learned profession, or by the physicians who have incorporated their own organization.

Incorporation of a "not for profit" institution is of course mere charlatanry, a business pretense to avoid taxes, and like a "fire sale" advertisement serves to attract the unthinking, the credulous and the unwary. These ventures all make a profit and expect to, or they would not operate.

Business men, social theorists and salaried altruists who are not qualified by education or mentality to practice medicine or to understand even in part its varied responsibilities have set up a hue and cry against the high cost of medical care. This furor based on a minimum of truth arose partly from an inherent meddlesomeness and partly from a desire to enjoy the dignity and profit of corporate practice through wide publicity and the exploitation of hired physicians.

This seemed to be the easier path, more profitable and more rational in accomplishment since the practice of medicine had been advanced by ambitious scientists to a point where most of the serious emergencies were under control and all diseases could be carefully differentiated by special study through elaborate and expensive instrumentation and laboratories.

The establishment of corporate enterprises met with considerable difficulty in many states. On the part of the patient a change must be made in his mental attitude. His attachment and friendly intercourse with a natural person whom he had learned to respect and trust must be transferred to a cold impersonal business relationship with a fictitious person called a corporation in which all professional responsibility is dissipated and lost.

A more serious objection arose from the legal side. Here licenses were necessary and the statutes forbid a person to practice without such a document. A corporation cannot pass an examination and therefore cannot obtain the legal right to do medical work. Unless the laws of a state specially sanction incorporation for the practice of medicine such a license cannot legally be given out. The law in Illinois has been carelessly or ignorantly violated in the past by the issue of such legal permits which as Judge McKinley ruled were "improperly granted."

A California Court—(Judge Blake)—held that the right to practice medicine attaches to the individual and cannot be made a subject of business sheltered under the cloak of a corporation having marketable shares descendable under the laws of inheritance.

The further statement was made that because a Workman's Compensation Act compelled all employers to furnish medical and surgical aid to the injured in the course of their employment such a condition did not offer any reason for a corporation to engage in the practice of medicine.

A corporation is a distinct entity. If a group of physicians or a medical society incorporates for the purpose of conducting a hospital, clinic or dispensary that body is still a *lay* corporation. This should be emphasized. Such an organization is not vested with a business or a professional character simply because it is formed by persons engaged in a special pursuit. It is a separate

personality which does not change. A mob is a mob whether composed of outlaws or missionaries. A corporation formed and conducted by women is not necessarily a female seminary.

Two further objections to corporate practice appear. The state would suffer a serious disadvantage in such a situation since it could not control a corporation as it does an individual under the Medical Practice Act in case of unprofessional conduct or moral turpitude. A corporation can be fined but not imprisoned.

Furthermore the corporate practice of medicine is against public policy for if such a procedure became an accepted custom it would be the opening wedge to commercialization in the practice of a learned profession and would not only permit but favor or stimulate the creeping in of many unethical and uncontrollable factors which the law has sought hitherto rigidly to exclude.

Medical men, possibly through ignorance of the law, have often formed similar organizations on a "not for profit" basis with such specious titles as clinics, leagues, centers, etc., which are, in many instances, merely camouflaged forms of commercialized medical practice. When physicians incorporate, the product is a lay corporation.

The doctors of Illinois have been through a prolonged and concrete experience with corporate practice which is highly educational.

Shortly after the war the Public Health Institute was incorporated for the wholesale treatment of venereal disease in Chicago. The Medical Society held numerous conferences with its managers to secure a change in form or some kind of accommodation. It was futile. Although incorporated as "not for profit" the institution piled up enormous profits and it was soon discovered that the medical practice act of that time was not comprehensive enough to meet and control this particular emergency.

In 1921 the Medical Society had a bill brought up in the legislature to prevent the practice of medicine by corporations. It was referred to the Committee on Public Health and Hygiene and at the hearing a well known lawyer who was on the Board of the Institute got enfevered by his own arguments and finally declared that "it did not make any difference to his organization whether they passed the bill because even if it became a law they would not pay any attention to it." The bill was tabled. Again in 1927 Senate Bill No. 291 was introduced by Senator Mason. It was tabled on third reading. In 1929 Senate Bill No. 231 was introduced by Senator Searcy of Springfield. Now the Executive Committee of the Chicago Association of Commerce obtruded a jaundiced hand under the lash of a member who was on the Board of the Institute. With the facile flexibility of ignorant mediocrity they issued a resolution condemning the Society and supporting corporate practice. This parvitude of perspective prevailed and the bill was smothered without mercy.

While passing through these experiences a number of high spirited men in the State Society resolved to obtain a new medical practice act which would afford the doctor as competent protection in his professional work as the lawyer enjoyed.

The services of Harry Eugene Kelly, a specialist in legal medicine, were enlisted and in 1923 the present practice act passed the legislature. This act has been persistently opposed by corporations, by lay promoters and the whole swarm of guerrilla bands who are constantly attacking the ethical practice of medicine. Different phases of its regulations have been up before the State Supreme Court at least half a dozen times but in every instance the act has been sustained and the opinion is now general that this particular piece of legislation is the best medical practice act on the statute books of any state.

In 1932 the Chicago Medical Society authorized a committee to bring suit under the provisions of the Act against a corporation which was practicing medicine in Chicago. Such a suit must be brought by the state's attorney in behalf of the people of Illinois and Harry Eugene Kelly was appointed Assistant State's Attorney for this purpose.

Mr. Kelly brought an action in qua warranto demanding that the corporation explain *why* it was "exercising powers not conferred by law." The trial was held and a judgment favorable to the society was handed down. The case was appealed to the Supreme Court but the defeated corporation was induced by some surreptitious influence to withdraw its appeal on the eve of a decision.

Again in 1934 a suit was brought by the Illinois State Medical Society against the United Medical Service, a corporation avowedly practic-

ing medicine in Chicago. Once more Mr. Kelly was engaged and he was appointed Assistant Attorney General for the prosecution of this case by Attorney General Kerner.

A quo warranto action was begun and in spite of the delays, continuances, procrastinations, garrulity of counsel, demurrages and every other device for defeating the public interests Mr. Kelly held firmly to his job and in 1935 a sweeping decision which upheld all the contentions of the Medical Societies was issued by Judge McKinley of the Superior Court of Cook County.

This document showed that the Society "was entitled to have judgment against the corporation, *ousting* the respondent from the franchise, occupation and business of holding itself out to the public as being engaged in the diagnosis or treatment of human ailments and from suggesting, recommending or prescribing any form of treatment for the palliation, relief or cure of physical or mental ailments of persons, with the intention of receiving therefor either directly or indirectly any fee, or compensation and from diagnosticating, or attempting to diagnosticate, operate upon, profess to heal, prescribe for, or otherwise treat any ailment, or supposed ailment of another and from maintaining an office for the examination or treatment of persons afflicted, or alleged or supposed to be afflicted, by any ailment, and from usurping, intruding itself into, or unlawfully holding or executing any such franchise or occupation or business either by or through the services of physicians and surgeons duly licensed and registered under the medical practice act and employed and paid by the respondent or otherwise."

Following this comprehensive and categorical decision the defeated interests tried to get a bill through the legislature which would empower corporations to practice medicine but the attempt was as unsuccessful as the Medical Society's previous efforts against such practice.

This review of the legal battle is not unfamiliar yet the threat of corporate practice in a number of its protean forms is still with us and it seems to the writer that our medical men as a whole do not appreciate fully the wide-spread influence of this legal fulmination and its fundamental significance to the doctors of Illinois.

The validation of the medical practice act by repeated court decisions and the ultimate elimination of corporate practice by the Supreme Court's endorsement of Judge McKinley's decision is and will be most momentous. Indeed it is so basically important that its progressive influence will remove and prevent a vast number of social and commercial impediments to the ethical practice of medicine by all the licentiates of present and future generations.

Correspondence

ILLINOIS COMES THROUGH WITH A PERFECT MEDICAL LEGISLATIVE RECORD

FINAL LEGISLATIVE BULLETIN

59th Illinois General Assembly, Adjourned June 29, 1935.

A remarkable forecast very pertinent to our times was made two thousand years ago. The speaker, a man of clear vision and great understanding, declared:

"For there shall arise false prophets, and shall shew great signs and wonders; insomuch that, if it were possible, they shall deceive the very elect."

And then he added:

"But know this, that if the good man of the house had known in what watch the thief would come, he would have watched, and would not have suffered his house to be broken up."

To medicine as well as to economics has come a great army of false prophets, the cults on the one hand and the magicians of economics on the other. Both groups attempted to break up the "house" of scientific medicine through destructive legislation offered for enactment in the recently adjourned General Assembly. The wonders of their wares were so skillfully displayed that the very leaders among the lawmakers were tempted to the brink of acceptance.

To the everlasting credit of the medical profession the Illinois State Medical Society had posted a "watch" in the form of your Council and Officers. At every moment during the session when an alarm was sounded the alert physicians of the State who feel deeply their public responsibility and who cherish the high standards and the honorable traditions of their calling responded so effectively that no pernicious law affecting the practice of scientific medicine was enacted. Only the alertness and the superb cooperation of a large majority of the physicians in every part of the State prevented letting down

the bars to osteopaths, chiropractors, corporation medicine and compulsory health insurance.

Circumstances this year made the work of your Legislative Committee particularly difficult. Economic conditions complicated by the complex problems brought on by modern mechanical inventions have created a popular mania for social reform of every description. Unrest is general. People are irritable, confused and bewildered. It is the harvest season for false prophets. Every sort of Utopian scheme, no matter how fantastic, that promises something for nothing or at little expense, gets a hearing and gathers a following. There has been created a great popular wave of sympathy and sentiment for the "under dog," the "little man," the "underpaid" employee, the abused healer. While nobody, least of all the physician, dispute the needs of the underprivileged and the desirability of improving their lot there is such a thing as irrationalism, the indulgence of which will only add poison to the medicine of reform.

Taking advantage of this situation the osteopaths and chiropractors introduced bills which were pushed forward with such skillful finesse that several reached "second reading" in the House while others passed the Senate, arrived at "third reading" in the House and were defeated at the last moment.

Exceptionally well versed in legislative matters the osteopaths worked feverishly during the closing days of the Legislature when anything is possible in the congestion that nearly always marks the last week of law making. When evidence of stiff opposition developed the osteopaths abandoned their bill in the House in favor of the Senate bill which, if passed, would have permitted osteopaths to do surgery despite the limited education they received in that subject. With united support this bill passed the Senate and was defeated on the last night of the session in the House where it appeared on the calendar on third reading. This experience illustrates the degree of alertness required of your Legislative Committee up until the gavel falls for sine die adjournment.

The structure of medical standards in Illinois is the result of more than one hundred years of work on the part of physicians and public spirited citizens who had the interests of the public and of a scientific profession at heart. It required fifty years to establish permanent legislation requiring the licensure of physicians and the setting up of qualifications deemed reasonable at that time. It required another half century to arrive at the present day standards which Heaven knows are none too high. These standards have been challenged constantly and will continue to be threatened throughout the years to come by those who try the back door, short-cut entrance to medicine and whose lack of training and temperament for this profession is equalled only by their desire to exploit the public. The new threat is from those infected with the virus of naziism and fascism who would regiment the medical profession under impracticable compulsory insurance schemes and the corporation control over medicine. Upon both fronts the medical profession must fight in the future in behalf of the public good.

Out of the 1,850 bills introduced in the General Assembly this year about 100 affected more or less directly the medical profession. Among these were a dozen highly undesirable measures aimed at reducing the standards of medical practice or at the regimentation of physicians. The record on these bills is as follows:

H. B. 425. Corporation medicine legalized. **Defeated.**

H. B. 937. Health insurance, compulsory. **Defeated.**

H. B. 692. Osteopaths, enabling them to do surgery and prescribe medicine. **Defeated.**

S. B. 238. Chiropractors, independent board. **Defeated.**

H. B. 780. Chiropractors, liberalized licensure. This bill had the personal support of the Mayor of Chicago. **Defeated.**

S. B. 363. Chiropodists, refused to accept amendments offered by the Illinois State Medical Society. **Defeated.**

S. B. 515. Osteopaths, would allow osteopaths to do surgery. **Defeated.**

S. B. 257. Physicians, annual license fee, would have legalized a nuisance tax annually against physicians. **Defeated.**

S. B. 210. Tax, 3 per cent. income, M. D.'s and others. **Defeated.**

A complete list of the bills relating to medicine and medical practice from various angles and the fate of each is appended. One bill, H. B. 1103, which would have given hospitals and practitioners for services rendered a first lien on funds available to persons injured through the fault of a third person, was favored by the medical profession but was lost.

To the State Department of Public Health was appropriated for the biennium $1,252,828. This provides only 8 cents per capita per year for the important functions of the State health service and makes Illinois rank thirtieth among States and territories in the per capita appropriations for this purpose. The interests of the public and the desire of organized medicine demand more adequate appropriations for public health service so that the application of preventive medicine in this State may meet more adequately the needs.

Credit for the successful functioning of your Legislative Committee is due in no small measure to the splendid and prompt cooperation of thousands of members of the Society, upon the steadfast and unfailing support of its officers and councillors, upon the timely assistance and advice generously given by officers of the American Medical Association, particularly by Dr. Woodward. For all of this your Legislative Committee is deeply appreciative. Your Committee is grateful also to the hundreds of fellow physicians and others who took the time and the pains to communicate their appreciation of the work undertaken and accomplished under unusual difficulties during the strenuous session of the General Assembly.

A copy of any of the bills listed may be had upon request.

MEASURES OF MEDICAL INTEREST

Cult

H. B. 780. Liberalize chiropractors' licensure. **Defeated.**

S. B. 238. Independent exam. board, chiropractors, etc. **Defeated.**

H. B. 692. Independent exam. boards, osteopaths. **Defeated.**

H. B. 781. Requires 4 years training chiropodist. **Defeated.**

S. B. 363. Requires 4 years training chiropodist. **Defeated.**

Medical Profession

H. B. 425. Corporation Medicine legalized. **Defeated.**

H. B. 937. Compulsory Health Insurance. **Defeated.**

S. B. 257. Annual Registration M. D.'s. **Defeated.**

S. B. 210. Three per cent. gross income tax, professions and occupations. **Defeated.**

H. B. 504. Changes language to conform with Civil Practice Act. **Passed.**

S. B. 515. Contained an objectionable osteopathic section. **Defeated.**

Appropriations

H. B. 855. Dept. Public Welfare, $44,113,318. **Passed.**

Ordinary and Contingent, $26,284,090; conveyance committed persons, $65,000; working fund, $1,500,000; U. S. veterans, $430,000; mothers' pensions, $1,000,000; permanent improvements, $15,000,000; criminal identification, $50,000.

S. B. 228. Blind Pensions, Emergency, $533,700. **Passed.**

S. B. 641. Old Age Pensions ($1 per day over 65), $6,000,000. **Passed.**

S. B. 643. Emergency Relief, $45,000,000. **Passed.**

H. B. 1. Emergency Relief (Deficiency), $9,000,000. **Passed.**

H. B. 834. Dept. Public Health, $1,252,828. **Passed.**

H. B. 835. Disabled veterans in hospital, $45,000. **Passed.**

H. B. 836. Supervising child boarding homes, $108,310. **Passed.**

H. B. 837. Blind prevention—trachoma, $45,000. **Passed.**

H. B. 1097. Blind pensions, $2,000,000. **Passed.**

H. B. 977. Widows with dependent children, $2,000,000. **Passed.**

H. B. 1098. Commission Phys. handicapped children, $7,500. **Passed.**

H. B. 879. Little Omnibus, $2,936,739. **Passed.**

Vocational education, $400,368; rehabilitation, $363,500; deaf, blind, etc., education, $574,200; deaf delinquent, etc., education (re-app.), $132,373; edu. crippled (re-appropriation), $114,018; schools, crippled, $800,000; boards of edu., blind, etc., $30,000; lisabled veterans, $4,000; Spanish War veterans, $5,000; vets. foreign wars, $5,000; 33rd Division, $4,000; Grand Army Hall, $5,500; G. A. R., Illinois Dept., $2,500.

Licenses: The following licensing bills were acceptable to the Illinois State Medical Society except the ones that were defeated:

S. B. 510. Beauty culture, strengthens and facilitates regis. **Passed.**

S. B. 511. Chiropody, strengthens and facilitates regis. **Passed.**

S. B. 512. Dental surgery, strengthens and facilitates regis. **Passed.**

S. B. 513. Embalmers, strengthens and facilitates regis. **Passed.**

S. B. 515. Medical Practice Act, strengthens and facilitates regis. **Defeated.**

S. B. 516. Optometry, strengthens and facilitates regis. **Passed.**

S. B. 517. Nurses, strengthens and facilitates regis. **Passed.**

S. B. 518. Pharmacy, strengthens and facilitates regis. **Passed.**

S. B. 523. Veterinary med. and surg. examinations for, etc. **Passed.**

S. B. 639. Dental Surgery Professional fee fund." **Defeated.**

S. B. 519. Plumbers. **Defeated.**

S. B. 274. $120 tax on patent medicine vendors. **Defeated.**

S. B. 288. Beauty culture license regulation. **Passed.**

S. B. 473. Empowers cities to regulate barber shops, etc. **Passed.**

S. B. 509. Examining Committee for barbers. **Passed.**

H. B. 741. Regulates training and licensure of barbers. **Defeated.**

H. B. 863. Licensure of contraceptive vendors. **Defeated.**

H. B. 44. Licensure of narcotics (Uniform Narcotic Act). **Passed.**

H. B. 1085. Increased License Fees for M. D.'s. **Defeated.**

H. B. 559-591. Regulates Optometry. **Defeated.**

S. B. 289-533. Regulates Optometry. **Defeated.**

S. B. 257. Annual Reg. of M. D.'s and earmarked fees. **Defeated.**

H. B. 320. Revoke M. D. license for false health certificate. **Defeated.**

S. B. 452. Regulates licensure of plumbers. **Passed.**

Blindness

H. B. 573. Repeals blind pension tax as part of gen. levy. **Passed.**

H. B. 572. Requires special levy for blind pensions. **Passed.**

H. B. 146. Dog guides common carrier privileges. **Passed.**

S. B. 65-66-67-117-150-429-430 relate to blindness. **Defeated.**

H. B. 18-65-153-342 relate to blindness. **Defeated.**

Children

S. B. 475. Requires proportionate distribution of crippled child school fund. **Passed.**

H. B. 316. Provides for removal of teachers of crippled children. **Defeated.**

S. B. 591. Amends Child Labor Law. **Defeated.**

H. B. 1089. Amends Child Labor Law. **Defeated.**

H. B. 155. Prohibits word "illegitimate" in adoption records. **Defeated.**

Medical Examination

H. B. 319. Health Certificate for teachers. **Defeated.**

H. B. 191. For Ven. Dis. prior to marriage. **Defeated.**

H. B. 320. Revoke M. D. license for false certificate health. **Defeated.**

Milk

H. B. 730. Prohibits sale of filled milk. **Passed.**

S. B. 229. Facilitates State supervision over pasteurization. **Passed.**

H. B. 1148. Creates milk marketing board. **Defeated.**

Employment

S. B. 176. 1 day's rest in 7, exceptions. **Passed.**

S. B. 464. Repeals private employment agencies act. **Passed**

S. B. 157. 8 hour day for women, nurses excepted. **Defeated.**

H. B. 276. Provides percentage garnishment wages. **Defeated.**

H. B. 225. 8 hour day for women, nurses excepted. **Defeated.**

H. B. 704. Health regulations—metal industry. **Defeated.**

H. B. 92. 5 day week—certain occupations. **Defeated.**

H. B. 675. Forbids employment discrimination for hernia. **Defeated.**

Embalmers

H. B. 579. Regulates training and licensure. **Passed.**

H. B. 580. Extends present examining board to include funeral directors. **Defeated.**

S. B. 302. Required only 2 years apprenticeship for licensure. **Defeated.**

Hospitals

H. B. 814. Non-profit hospital corporation. **Passed.**

H. B. 109-236-1103. Liens for services to injured. **Defeated.**

H. B. 425. Corporations—medical practice act. **Defeated.**

S. B. 647. Maternity—city may construct. **Passed.**

S. B. 648.—Contagious diseases—city may erect. **Passed.**

H. B. 66. Authorized T. B. San. tax in cities 75,000-100,000. **Passed.**

Insurance

H. B. 64-75-217-264. Unemployment insurance. **Defeated.**

H. B. 937. Social health insurance. **Defeated.**

Illinois Emergency Relief

S. B. 644. Extends Emerg. Relief Com. to March 1, 1937. **Passed.**

H. B. 1143. Commission continued. **Defeated.**

H. B. 1144. Appropriation to administer. **Defeated.**

H. B. 106. Amends and adds to. **Defeated.**

S. B. 71. Abolishes Illinois Emergency Relief Com. **Defeated.**

Industrial Hygiene

H. B. 233. Workmen's compensation benefits increased. **Defeated.**

S. B. 297. Regulates spray painting. **Defeated.**

H. B. 634. Requires exhaust system, certain industries. **Defeated.**

Legislators

S. B. 136. Provides 2 additional Univ. Scholarships for each legislator. Vetoed.

Miscellaneous

S. B. 409. Creates State Bureau of Chemistry. **Defeated.**

S. B. 658. Creates Health and Safety Commission, Dept. Labor. **Defeated.**

S. B. 999. Creates Office Director of Relief. **Defeated.**

H. B. 428. Requires certif. title for firearms. **Defeated.**

H. B. 384. Would prohibit use chipped, cracked utensils. **Defeated.**

H. B. 1136. Requires M. D. in fire departments. **Defeated.**

S. B. 394. Repeals township pauper tax. **Passed.**

S. B. 406. Re-establishes county pauper tax. **Passed.**

Motor Vehicle

H. B. 30-31-47. Drivers' license. **Defeated.**

H. B. 577. Stop hitchhiking. **Defeated.**

H. B. 360. Requires safety glass in new autos after 1935. **Passed.**

H. B. 334. Requires rest rooms each 50 miles, motor lines. **Defeated.**

Pensions, Old Age

H. B. 940. Old age, $1 per day over 65. **Passed.**

S. B. 641. Old age $6,000,000 to administer H. B. 940. **Passed.**

H. B. 16-65-137-144-179-181-182-255-263-649-1142 and S. B. 191-196-604-635. All related to old age pensions. Some of these were fantastic in extreme. **Defeated.**

A total of 27 other bills related to pensions for various special groups, such as judges, firemen, public employees, etc. **Defeated.**

Radio

H. B. 143. Prohibits fraudulent advertising. **Passed.**

Tax

S. B. 207. Raises sales tax to 3 per cent. **Passed.**

S. B. 208. Raises gas tax to 4c per gallon. **Defeated.**

Sanitation

S. B. 73. Prohibits garbage dumps in cities. **Defeated.**

S. B. 74. Validates appropriation by sanitary districts. **Passed.**

S. B. 75. Broadens powers of Chicago San. Dist. **Passed.**

S. B. 109. Regulates Municipal swimming pools construction. **Passed.**

S. B. 596. Parks to grant water source sites to cities. **Passed.**

S. B. 597. Extends waterworks bonds to 25 instead of 20 years. **Passed.**

Numerous other bills. **Defeated.**

Sterilization

H. B. 97. Authorizes sterilization certain inmates of State institutions. **Defeated.**

Tuberculosis

H. B. 66. San. Tax in cities 75,000-100,000. **Passed.**

S. B. 574. Liberalizes tax levy for municipal sanitarium in cities over 200,000. **Passed.**

H. B. 1102. Spread new levy 1935 Municipal Sanitarium. **Passed.**

H. B. 562. Regulates payment on pure bred cattle T. B. reactors. **Passed.**

H. B. 176. Abolishes County area and veterinarian. **Defeated.**

S. B. 627. Amends county T. B. law. **Defeated.**

H. B. 334. Amends city sanitarium law. **Defeated.**

Workmen's Compensation Act

S. B. 159. Extends all rights to poor. **Passed.**

S. B. 178. Shifts hearings from Commission to County Courts. **Defeated.**

S. B. 195. Adds neck, face, hand injuries to compensable. **Passed.**

H. B. 706. Copy of M. D.'s report must go to injured employee. **Passed.**

H. B. 676. Regulates treatment of hernia. **Defeated.**

H. B. 237. Adds industrial disease to compensable list. **Defeated.**

S. B. 104. Creates state fund by employer tax for compensation. **Defeated.**

S. B. 659. Regulates payment of compensation. **Defeated.**

Drugs

H. B. 44. Regulates sale of Narcotics (Uniform Law). **Passed.**

H. B. 96. Imposes 10 per cent. tax patent medicine mfg. **Defeated.**

S. B. 274-408 and H. B. 672. Related to drugs and narcotics—all dropped in favor of H. B. 44.

Dogs

H. B. 332. Authorized killing under provocation. **Defeated.**

H. B. 344. Prohibits hunting dogs at large. **Defeated.**

H. B. 78. Provides payment for injury to dogs. **Defeated.**

H. B. 609. The Anti-Vivisection Bill. **Defeated.**

Respectfully submitted,
Thomas P. Foley, M. D.,
Mather Pfeiffenberger, M. D.,
John R. Neal, M. D.,
Legislative Committee.

A LAYMAN'S VIEW OF THE PROBLEMS THAT CONFRONT THE MEDICAL PROFESSION

Chicago, Illinois, July 27, 1935.

To the Editor:

Besides the age-old problems of finding cures for malignant diseases and illnesses which to the present day are termed as fatal or incurable, the medical profession is facing some acute problems in reference to medical practice and to future medical service for our citizens.

The potential members of the medical profession are confronted with the realization that the field is already crowded, and that the medical colleges are graduating doctors of medicine in ever-increasing numbers. The road to being a successful physician is long and expensive, and the final returns of material things are not great. Earning a living, even for the established physician, is frequently a matter of concern; it is, therefore, quite evident that the number of practicing physicians should be restricted to those who possess expertness, a high character and a vital personality. If medical colleges would resist the temptation to take more students merely to make money, and would accept the doctrine of "quality first," there would probably be a solution of the question as to the excessive numbers in the profession.[1]

The possibility of the enactment of an antivivisection law, prohibiting the use of lower animals for medical experimentation, concerns particularly the scientific practitioner and the research worker. The list of diseases that can now be controlled through knowledge gained by animal experimentation is long. Insulin for the treatment of diabetes may be mentioned as an example. Antivivisectionists, a minority group, seem to be guided by purely emotional personal reactions. The law which they propose would be detrimental and far-reaching, inasmuch as it would limit the development of knowledge that might affect the entire population.[2]

In the search for economic security, many of

the states and our federal government have, at times, tried to institute compulsory health insurance plans. Many years of observation and study of various European plans definitely demonstrates that compulsory health insurance has some very serious faults: It gives free medical service to those who have not honestly earned it, and thereby deprives the medical practitioner of his just rewards; it encourages an inferior quality of medical service for the citizens of a nation; it creates a future race of malingerers and office holders to live off the earnings of the self reliant. Morbidity and mortality statistics show that compulsory health insurance has a deleterious effect upon society and the medical profession as well. Free medical service may seem desirable in our present economic chaos, but a political plan for compulsory health insurance is not feasible; no social insurance laws can be devised that will cover those who are mentally or physically unfit to work. Not only does a medical practice by a political plan destroy the individualism of the medical practitioner, but it also destroys the integrity of the average citizen.[3]

1. Walters, Raymond: "Should the Number of Professional Students Be Restricted?" J. A. M. A., 114: 1051-57, 1935.
2. Reed C. I.: "Why Is An Antivivisectionist?" Ill. M. J., LXVII, 67: 135-142, 1935.
3. Ochsner, Edward H: "The Quest for Economic Security." Women, II: 5, 28, 29, 1935.

Ida Burkhalter, R. N., 454 Deming Place.

SENATOR SEARCY APPRECIATES THE CO-OPERATION OF THE ILLINOIS STATE MEDICAL SOCIETY

FIFTY-NINTH GENERAL ASSEMBLY STATE OF ILLINOIS
SENATE

July 3, 1925

Dr. J. R. Neal,
Legislative Representative,
Illinois State Medical Society,
Springfield, Illinois.

Dear Dr. Neal: The Fifty-ninth General Assembly has adjourned and I would like to take this opportunity of writing you a letter of appreciation.

The members of the Legislature at least those of us who like to be informed on all sides of a pending measure, have long since learned to depend on responsible Representatives to a marked degree for that information. An accredited representative, in my judgment, is as essential a part of legislation as the introduction of bills. I am a strong advocate of it and personally make free use of information and advice and analyses that representatives of the various organizations who are interesed in specific bills have to offer. By such a course we form our judgments. In that there were almost 1,900 bills introduced this last session, the need of outside help in the matter of digesting and understanding the various measures is obvious.

May I take this opportunity to tell you, and, through you, your esteemed Society, that, as one legislator, I appreciate the real courtesies extended by you to the legislators, during the session just closed as well as the previous ones over the great number of years that you have been chosen to represent the thousands of ethical physicians belonging to the Illinois State Medical Society?

I have heard your excellent cooperation favorably commented upon on many occasions and feel that you should know it. I want to congratulate the Illinois State Medical Society, and you personally, for the very fine dignified manner in which you carry on your legislative work.

With cordial regards, I am

Yours,
(Signed) EARL B. SEARCY.

UNION CATALOGUE OF MEDICAL LITERATURE IN CHICAGO NOW OPEN FOR REFERENCE

Two years ago the Institute of Medicine of Chicago made available an initial fund for the establishment of a union catalogue of medical literature in Chicago. The work of organization of this project was entrusted to a Committee on Coordination of Medical Libraries in Chicago, which had been appointed a year before. The first aim of the committee was to bring about a closer integration of effort among the major medico-biological libraries of the city (John Crerar Library, Universities of Chicago, Illinois, Northwestern, and Loyola, Rush Medical College) to obviate unnecessary duplication, triplication or even quadruplication of special literature, and divert the economies achieved to a fuller representation of the world's medical literature in Chicago. The second aim was the creation of a union card index centrally placed,

so that investigators in medical problems are able to locate the desired reference volumes with the least expenditure of time and energy. It is hoped that eventually the service of the catalogue will be made even more effective by the attachment of a permanent librarian and the availability of information by telephone.

The task of achieving such a union catalogue and its cost in effort and money are much greater than the original estimates indicated. The work toward its completion is still in progress. At the present time the cards representing the holdings in the libraries of the Colleges of Medicine and Dentistry of Northwestern University, of the Colleges of Medicine, Dentistry, and Pharmacy of the University of Illinois, most of the holdings in the bio-medical libraries of the University of Chicago, and much of those in the John Crerar Library and in the library of Rush Medical College are already inserted in the index, while none of the holdings in the library of the school of medicine of Loyola University are included as yet. But all of such work will be brought to completion as soon as possible. Every month these different medical libraries are sending in the cards of their new acquisitions, so that the catalogue is brought to date. It is hoped that in time the important holdings in the smaller medical libraries in the city will be represented in the catalogue. The final editing of this union index may not be accomplished before another two or three years have passed. Despite its present gaps and imperfections, the catalogue has already given valuable service to the medical librarians of the city and to investigators who were aware of its existence.

The union catalogue is now open to a wider medical public, which is invited to make use of it for reference and to cooperate in its further development and extension of service. It is located on the 12th floor, or floor of the medical reading rooms, in the John Crerar Library. Further information concerning it may be obtained from the medical librarians indicated above, or from the central office of the Institute of Medicine of Chicago, 629 S. Wood Street. Criticisms or suggestions should be sent to the latter.

June, 1935. Otto F. Kampmeier, M. D.,
Chairman, Committee on
Coordination of Medical
Libraries in Chicago.

WOMAN'S AUXILIARY MARKS PROGRESS

The Woman's Auxiliary to the Illinois State Medical Society completed its eighth year at the annual convention held May 21 to 23, 1935, in Rockford, Illinois. This was the largest meeting ever held, with an increase of 66 per cent. in attendance over last year.

We have an advisory Committee of five members, appointed by the President of the State Medical Society. Our committees correspond with those of the National Auxiliary.

Organization. This committee organized three new Counties and one branch of the Cook County Auxiliary. There are twelve counties ready to be organized, having just received permission from their County Medical Societies. The membership was increased by about 175 new members this year.

Public Relation. The Public Relation Committee felt we needed some type of authentic health literature that could be placed in all public reading rooms throughout the State, to counteract the magazines of quacks, cure-alls, faddists, and the *Christian Science Monitor.* This to be done without expense to the Auxiliary, as we did not have sufficient funds to pay for subscriptions. We procured the help of our State Health Department at Springfield, and by furnishing it with a mailing list sent in by each County, "The Illinois Health Messenger," a bi-monthly magazine, published by the State, has been placed in hundreds of reading rooms and libraries.

The booth at a Century of Progress was again maintained by the Cook County Auxiliary, its members acting as hostesses each day of the fair, and gave short lectures to every group interested in the progress of medicine during the past 100 years, in Illinois.

The Public Relation committee also furnished Women's Clubs with material for health programs, and kept such clubs informed as to when lectures on health problems would be given by members of the Medical Society.

Program. This committee furnished us with the finest program that has ever been given this Auxiliary. It contained suggestions, and material that could be used by every County, for both educational and social programs. It emphasized "Health Education," and in following this program frequent lectures were given by members of the State Medical Society to the Auxiliary members. Every doctor's wife must be able to answer intelligently and discuss with knowledge the subjects brought up by the laity. "Read your State Medical Journal." It also originated our own "Study Envelope," which was mailed each month to every County President, containing material on health problems of importance for that month. These were edited by the Educational Committee of the Illinois State Medical Society.

Legislative. The work of this committee is carried on entirely under the instructions given by the Legislative Committee of the State Medical Society. This year we were asked to prevent the introduction of a bill prohibiting vivisection. This was done by our members being intelligently informed on the value of

animal experimentation, and so informing our lay friends, and clubs. At the request of the committee for the Protection of Medical Research, the Cook County Auxiliary obtained thousands of signatures protesting against any change in the Arvey Ordinance, which would affect all research work in the United States. Other bills that we interested our group in with regard to Medical Practice were, 1. "The Practitioners' Lien Act," this bill would give physicians and hospitals first lien on funds collected on account of accidents that were cared for by them at the time of the accident. 2. A bill to legalize the practice of medicine by corporations. Not passed. 3. The Osteopathic bill wishing to set up an independant State examining board, and open a way to legalizing Osteopaths to practice surgery and all other forms of medicine. 4. Chiropractors have tried to introduce a similar bill. To date none of the bills of detrimental character to the Medical Profession have been passed.

Hygeia. The Chairman of *Hygeia* reported our quota was 100 subscriptions, and we turned in 223. Besides placing paid subscriptions in their Counties, several Auxiliaries collect the old magazines from their members, and place these in public reading rooms. May I quote from the Chairman's report, "My work in *Hygeia* has been most pleasurable, and hope this wonderful magazine will soon be in every American home."

Press and Publicity. This department has furnished splendid articles for the ILLINOIS MEDICAL JOURNAL every month this year and reported on each State Board Meeting. Some of the outstanding articles were: "Greetings to the Illinois State Auxiliary," by Mrs. Robert W. Tomlinson, President of the Woman's Auxiliary to American Medical Society. "The Age of New Things," by Dr. Charles S. Skaggs, President Illinois State Medical Society, "Urgent Work for the Woman's Auxiliary," by Dr. John R. Neal, Chairman Legislative Committee, Illinois State Medical Society.

Finance. A uniform voucher system to be used by all Board Members when rendering bills was submitted by the finance committee, and adopted. Also several other important changes were made of which two were of importance. 1. The Finance chairman keep a monthly account of all budgets, and send a monthly statement to the President. 2. That each Board member send in monthly bills. For the first time this committee was able to present a budget for next year, which was accepted.

Archives. The Chairman of Archives submitted an outline to be followed by the County Auxiliaries for writing this year's history. This has been a great help to the presidents, and also keeps the reports uniform. For the first time we held a Memorial Service at our Annual Convention.

In closing, I would like to say that cooperation, unity of Auxiliary members, knowledge and sincere understanding will make strength with which we can stand behind our husbands and their difficult problems, and be of great assistance to them, and the Medical profession.

OUTLINE OF ACTIVITIES FOR THE COMING YEAR

1. Familiarize yourself with Medical Legislation program.
2. Educate the laity as to the value of Organized Medicine.
3. What effect State Medicine would have on public.
4. Aid in exposing the mis-representation carried on by cure-all companies, especially over the radio.
5. When the doctor's fee bill is criticized as being too high, kindly remind the people with reference to the amount of charity work the doctors give.
6. Stress Public Relations.
7. When Medical subjects are to be discussed in clubs and lay organizations see to it that a physician of merit is the speaker.
8. Place *Hygeia* in schools, high schools, libraries and county or district schools.
9. Place authorized Medical Books in your libraries. If you can't buy them maybe some of the doctors would donate a volume from their library. See that space is given to Medical books.
10. One big undertaking is the compiling of a list of Public reading rooms where we can place *Illinois Health Messenger.*
11. Use of films in schools and clubs furnished through Illinois State Health Department, free.
12. Use speakers Bureau of Illinois State.
13. Read the Journals, State and National.
14. Know both sides of the question.
15. The merits of vivisection.
16. What has anti-vivisection given the public in health measures?
17. Distribution of booklet being prepared by Economic Committee of State Society.
18. Know the doctors' wives in your community and create a friendly spirit among them.

MRS. LUCIUS COLE,
President.

ILLINOIS HOSPITALS REGISTERED BY THE AMERICAN MEDICAL ASSOCIATION

The following list contains the names of hospitals, sanatoriums and related institutions that are located in Illinois. It omits the names of hospitals which, after investigation, were not accepted. The inclusion of the name of any institution may be taken as an indication that evidence concerning irregular or unsafe practices in that institution has not come to the attention of the Council on Medical Education and Hospitals. The list is given in two sections: (1) hospitals and sanatoriums, and (2) related institutions. The related institutions include some general hospitals lacking certain essentials, nursing homes, school infirmaries, prison infirmaries, custodial and other institutions designed to give some medical, nursing or convalescent care in an ethical and acceptable manner, but not strictly hospitals. In the statistics the two classifications are consolidated. The words "No data supplied" following the name of

a hospital mean that no report was received although at least three requests were sent.

KEY TO SYMBOLS AND ABBREVIATIONS

* Approved for general internship, the fifth year in medicine, by the Council on Medical Education and Hospitals.

† Approved for certain residencies in specialties for graduates in medicine who have already had a general internship or its equivalent in private practice.

‡ School of nursing accredited by state board of nurse examiners.

§ Affiliated for nurse training on state accredited basis.

The column headed "Type of Service" tells what diseases or conditions are treated in each institution, as follows:

Ca	Cancer	ENT	Eye, ear, nose and throat
Card	Cardiac	Gen	General
Chil	Children	G&TB	General and tuberculosis
Chr	Chronic	Inc	Incurable
Conv	Convalescence and rest	Indus	Industrial
Drug Epil	Drug and alcoholic Epileptic	Iso	Isolation
Inst	Institutional	Orth	Orthopedic
Mat	Maternity	SkCa	Skin and cancer
MatCh	Maternity and children	TB	Tuberculosis
MeDe	Mentally deficient	TbIs	Tuberculosis and isolation
Ment	Mental	TbOr	Tuberculosis and orthopedic
N&M	Nervous and mental	Ven	Venereal

The column headed "Control" indicates for each institution the ownership, control, or auspices under which it is conducted, as follows:

GOVERNMENTAL

Federal	State
Indian Affairs	City
United States Army	County
United States Navy	City-County
United States Public Health Service	
Veterans Administration Facility	

NONPROFIT ORGANIZATIONS	PROPRIETARY
Church	Individual
Fraternal	Partnership
Nonprofit association	Corporation (unrestricted as to profit)

ABBREVIATIONS

CyCo	City and county	Indiv	Individual
Corp	Corporation unrestricted as to profit	NPAssn	Nonprofit association
Fed	Federal	Part	Partnership
Frat	Fraternal	USPHS	United States Public Health Service
I A	Office of Indian Affairs, Department of the Interior	Vet	Veterans Administration Facility

Population of cities is based on the 1930 census of the United States Bureau of the Census. Consultation with the Bureau led to this decision. State population is based on estimates of the Bureau as of July 1934.

HOSPITALS AND SANATORIUMS

	Type of Service	Control	Beds, Rated Capacity	Bassinets	Number of Births	Average Patients	Patients Admitted
Alton, 30,151—Madison							
Alton State Hospital‡	Ment	State	1,537	..	..	1,483	401
St. Anthony's Infirmary and Sanitarium	Gen	Church	90	..	..	40	435
St. Joseph's Hospital‡	Gen	Church	75	15	175	33	2,142
Amboy, 1,972—Lee							
Amboy Public Hospital	Gen	Corp	12	3	23	4	147
Anna, 3,436—Union							
Anna State Hospital‡	Ment	State	2,047	..	..	2,002	679
Hale-Willard Memorial Hosp.	Gen	City	15	4	22	6	234
Annawan, 489—Henry							
J. M. Young Hospital	Gen	Indiv	21	2	5	2	142
Aurora, 46,589—Kane							
Copley Hospital‡	Gen	NPAssn	109	18	323	40	1,809
Kane County Spring Brook Sanitarium	TB	County	85	..	..	81	82
Mercyville Sanitarium	N&M	Church	150	..	..	124	183
St. Charles Hospital‡	Gen	Church	100	20	285	40	1,554
St. Joseph Mercy Hospital‡	Gen	Church	120	20	334	55	1,746
Batavia, 5,045—Kane							
Bellevue Place Sanitarium	N&M	Corp	36	..	..	23	14
Fox River Sanitarium	TB	NPAssn	50	..	..	45	49
Belleville, 28,425—St. Clair							
St. Elizabeth's Hospital	Gen	Church	110	15	230	51	1,981
Station Hospital	Gen	Army	35	..	..	10	215
Belv'dere, 8,123—Boone							
Highland Hospital	Gen	Corp	25	10	65	..	387
St. Joseph's Hospital	Gen	Church	40	12	68	18	625
Benton, 6,210—Franklin							
Moore Hospital	Gen	Indiv	25	1	11	12	289
Berwyn, 47,027—Cook							
Berwyn Hospital	Gen	NPAssn	75	18	233	23	1,464
Bloomington, 30,930—McLean							
Mennonite Hospital‡	Gen	Church	78	11	166	42	1,269
St. Joseph Hospital‡	Gen	Church	250	20	297	135	3,014
Blue Island, 16,534—Cook							
St. Francis Hospital	Gen	Church	85	15	209	29	1,186
Breese, 1,957—Clinton							
St. Joseph Hospital	Gen	Church	25	3	13	10	334
Bushnell, 2,856—McDonough							
Elmgrove Sanatorium	TB	County	36	..	..	28	33
Cairo, 13,532—Alexander							
St. Mary's Hospital‡	Gen	Church	100	6	54	30	891
Canton, 11,718—Fulton							
Graham and Murphy Hospital‡	Gen	NPAssn	48	8	133	27	1,333
Carbondale, 7,523—Jackson							
Holden Memorial Hospital‡	Gen	Church	50	5	76	15	579
Carlinville, 4,144—Macoupin							
Macoupin Hospital	Gen	Indiv	20	6	52	10	489
Carmi, 2,932—White							
Carmi Hospital	Gen	Corp	10	2	3	3	135
Centralia, 12,583—Marion							
St. Mary's Hospital	Gen	Church	45	4	54	19	767
Champaign, 20,348—Champaign							
Burnham City Hospital‡	Gen	City	74	17	244	41	2,415
Charleston, 8,012—Coles							
M. A. Montgomery Memorial Sanatorium	Gen	NPAssn	21	4	21	8	301
Oakwood Hospital	Gen	Indiv	23	4	11	5	210
Chicago, 3,376,438—Cook							
Albert Merritt Billings Hospital (Medical and Surgical Department of University of Chicago Clinics)							
Alexian Brothers Hospital*‡	Gen	Church	256	..	..	156	3,014
American Hospital*‡	Gen	NPAssn	150	20	129	68	1,921
Auburn Park Hospital	Gen	Corp	100	24	180	24	1,651
Augustana Hospital*†‡	Gen	Church	350	25	418	144	4,393
Belmont Hospital‡	Gen	Corp	100	36	369	43	2,318
Bethany Home Hospital	Gen	Church	14	2	16	9	215
Bethany Sanit. and Hosp.‡	Gen	Church	34	16	147	16	823
Bobs Roberts Memorial Hospital for Children (Pediatric Department of University of Chicago Clinics)							
Burrows Hospital	Gen	Indiv	40	6	No data supplied		
Chicago Eye, Ear, Nose and Throat Hospital	ENT	Corp	75	..	..	4	841
Chicago Fresh Air Hospital	TB	NPAssn	100	..	..	22	87
Chicago Lying-in Hospital and Dispensary†§	Mat	NPAssn	162	160	2,676	97	3,742
Chicago Memorial Hospital*	Gen	NPAssn	88	20	294	45	1,859
Chicago Policlinic	(See Henrotin Hospital)						
Chicago State Hospital†	Ment	State	4,118	4	3	4,451	1,644
Children's Memorial Hosp†‡	Chil	NPAssn	264	..	..	160	3,980
City of Chicago Municipal Tuberculosis Sanitarium†§	TB	City	1,206	..	..	1,126	1,725
Columbus Hospital*†‡	Gen	Church	160	22	222	85	3,190
Cook County Children's Hospital (Included in Cook County Hospital)							
Cook County Hospital†‡	Gen	County	3,300	222	4,576	2,756	73,086
Cook County Psychopathic Hospital†	N&M	County	185	..	..	..	..
Edgewater Hospital*	Gen	Corp	120	20	302	67	2,516
Englewood Hospital*‡	Gen	NPAssn	103	30	355	54	2,419
Evangelical Deaconess Hosp.‡	Gen	Church	66	20	115	24	699
Evangelical Hospital*‡	Gen	Church	200	60	862	93	4,259
Frances E. Willard Hospital*‡	Gen	NPAssn	115	25	589	65	3,038
Franklin Boulevard Hospital‡	Gen	Corp	60	20	188	44	1,654
Garfield Park Community Hospital*‡	Gen	NPAssn	150	32	445	63	3,175
Grant Hospital*‡	Gen	NPAssn	231	40	648	96	3,875
Henrotin Hospital‡	Gen	NPAssn	75	8	75	34	1,622
Holy Cross Hospital*	Gen	Church	85	24	508	64	2,624
Hospital of St. Anthony de Padua*‡	Gen	Church	200	40	686	107	3,550
Illinois Central Hospital*	Gen	Corp	255	21	355	120	3,456
Illinois Eye and Ear Infirm.†	ENT	State	200	..	..	178	5,272
Illinois Masonic Hospital*‡	Gen	Frat	159	25	274	65	2,376
Jackson Park Hospital*‡	Gen	NPAssn	225	33	456	61	3,040
John B. Murphy Hospital‡	Gen	Church	100	29	377	69	1,562
Lake View Hospital*‡	Gen	Corp	110	30	197	41	1,781
La Rabida Jackson Park Sanatorium	Card	ChNPAssn	56	..	..	30	127
Lewis Memorial Maternity Hospital	Mat	Church	114	114	2,161	67	2,474
Lutheran Deaconess Home and Hospital*†	Gen	Church	174	42	466	75	3,114
Lutheran Memorial Hosp.*‡	Gen	Church	175	36	327	52	1,991
Martha Washington Hospital	Gen	NPAssn	53	12	69	23	595
Mercy Hospital*‡	Gen	Church	360	30	323	156	4,770
Michael Reese Hospital*†‡	Gen	NPAssn	558	71	1,443	352	11,624
Misericordia Hospital and Home for Infants‡	MatCh	Church	17	26	374	9	386
Mother Cabrini Memorial Hospital*‡	Gen	Church	150	18	255	62	3,073
Mt. Sinai Hospital*†‡	Gen	NPAssn	160	44	864	101	4,526
Municipal Contagious Disease Hospital†§	So	City	428	..	..	278	3,832

	Type of Service	Control	Beds, Rated Capacity	Bassinets	Number of Births	Average Patients	Patients Admitted
Nancy Adele McElwee Memorial and Gertrude Dunn Hicks Memorial Hospital (Orthopedic Department of University of Chicago Clinics) Nelson Morris Hospital.... (Included in Michael Reese Hosp.)							
North Avenue Hospital	Gen	Indiv	14	2	7	6	225
Norwegian-American Hosp*‡	Gen	NPAssn	148	32	526	70	2,844
Parkway Sanitarium	N&M	Corp	50	..	..	28	239
Passavant Memorial Hosp*†‡	Gen	NPAssn	300	48	433	96	3,542
Peoples Hospital	Gen	Indiv	54	4	9	9	486
Pinel Sanitarium	N&M	NPAssn	50	..	..	20	145
Post Graduate Hospital and Medical School	Gen	NPAssn	85	3	15	13	670
Presbyterian Hospital*†‡	Gen	Church	412	50	680	241	8,685
Provident Hospital (col.)*†‡	Gen	NPAssn	133	22	347	76	2,491
Ravenswood Hospital*‡	Gen	NPAssn	150	48	777	81	3,907
Research and Educational Hospital*†	Gen	State	357	25	376	348	6,010
Roseland Community Hosp*‡	Gen	Corp	101	32	502	53	2,832
St. Anne's Hospital*‡	Gen	Church	235	60	1,009	139	5,188
St. Bernard's Hospital*‡	Gen	Church	200	30	513	90	5,292
St. Elizabeth Hospital*‡	Gen	Church	263	40	716	155	3,746
St. Joseph Hospital*‡	Gen	Church	150	35	448	74	2,573
St. Luke's Hospital*†‡	Gen	NPAssn	627	32	587	236	9,009
St. Mary of Nazareth Hosp*‡	Gen	Church	162	38	538	129	3,418
Total hospitals in Illinois, 320; general, 219; general beds occupied, 58.9 per cent; population per general bed, 283.							
St. Vincent's Infant and Maternity Hospital‡	MatCh	Church	41	10	112	11	124
Sarah Morris Hospital for Children (Included in Michael Reese Hosp.)							
Shriners Hospital for Crippled Children	Orth	Frat	60	..	..	60	200
South Chicago Community Hospital‡	Gen	NPAssn	69	15	147	18	936
South Shore Hospital‡	Gen	Corp	100	25	447	40	1,823
Surgical Institute for Crippled Children (Included in Research and Educational Hospital)							
Swedish Covenant Hospital*‡	Gen	Church	107	42	556	54	2,180
U. S. Marine Hospital*	Gen	USPHS	186	..	..	158	1,195
University Hospital*‡	Gen	Corp	100	21	109	36	1,394
University of Chgo. Clinics*†	Gen	NPAssn	262	..	..	177	5,961
Washington Boulevard Hospital*‡	Gen	NPAssn	100	10	93	46	1,612
Washington Home (Included in Martha Washington Hosp.)							
Welles Park Hospital	Gen	Corp	50	10	105	15	505
Wesley Memorial Hospital*‡	Gen	Church	229	21	442	106	3,370
West Side Hospital‡	Gen	Corp	142	19	197	54	2,017
Women and Children's Hosp.*	Gen	NPAssn	100	25	437	59	2,277
Woodlawn Hospital*	Gen	NPAssn	140	34	324	51	2,577
Chicago Heights, 22,321—Cook							
St James Hospital	Gen	Church	100	20	130	20	954
Clinton, 5,920—De Witt							
Dr. John Warner Hospital	Gen	City	25	4	35	3	300
Compton, 277—Lee							
Compton Hospital	Gen	Indiv	10	2	23	5	312
Danville, 36,765—Vermillion							
Lake View Hospital‡	Gen	NPAssn	158	12	121	54	1,577
St. Elizabeth Hospital‡	Gen	Church	150	18	240	61	2,235
Veterans Admin. Facility	Gen	Vet	562	..	..	435	1,563
Decatur, 57,510—Macon							
Decatur and Macon County Hospital‡	Gen	NPAssn	141	24	441	68	2,374
Macon County Tuberculosis Sanatorium†	TB	County	80	..	..	57	52
St. Mary's Hospital	Gen	Church	135	25	522	116	3,506
Wabash Employes' Hospital	Indus	NPAssn	85	..	..	56	1,200
De Kalb, 8,545—De Kalb							
De Kalb County Tuberculosis Sanatorium	TB	County	45	..	..	43	21
De Kalb Public Hospital	Gen	City	40	12	90	12	513
St. Mary's Hospital	Gen	Church	50	9	62	7	283
Des Plaines, 8,798—Cook							
Northwestern Hospital	Gen	Corp	16	6	32	3	..
Dixon, 9,908—Lee							
Dixon Public Hospital‡	Gen	NPAssn	60	11	127	27	820
DuQuoin, 7,593—Perry							
Marshall Browning Hospital	Gen	NPAssn	60	5	57	17	675
E. Moline, 10,107—Rock Island							
E. Moline State Hospital*†‡	Ment	State	1,951	..	..	1,850	602
E. St. Louis, 74,347—St. Clair							
Christian Welfare Hospital†	Gen	NPAssn	52	6	86	34	992
St. Mary's Hospital*‡	Gen	Church	260	35	377	105	3,661
Edwardsville, 6,235—Madison							
Madison County Tuberculosis Sanitarium	TB	County	90	..	..	79	132
Effingham, 4,978—Effingham							
St. Anthony's Hospital	Gen	Church	65	6	42	26	931
Elgin, 35,929—Kane							
Elgin State Hospital*†‡	Ment	State	3,900	..	..	4,151	1,800
Bethesda Sanitarium	N&M	Indiv	75	..	..	40	127
St. Joseph's Hospital	Gen	Church	100	20	204	50	2,087
Sherman Hospital‡	Gen	NPAssn	110	20	310	74	3,054
Elmhurst, 14,055—Du Page							
Elmhurst Community Hospital	Gen	NPAssn	80	20	282	30	1,632
Evanston, 63,338—Cook							
Evanston Community Hospital (col.)	Gen	NPAssn	18	4	11	4	102
Evanston Hospital*†‡	Gen	NPAssn	235	36	745	102	5,112
St. Francis Hospital*‡	Gen	Church	320	50	654	103	5,649
Evergreen Park, 1,594—Cook							
Little Company of Mary Hospital*‡	Gen	Church	150	24	414	65	2,097
Ft. Sheridan, 602—Lake							
Station Hospital	Gen	Army	216	4	47	133	3,675
Freeport, 22,045—Stephenson							
Evangelical Deaconess Hosp‡.	Gen	Church	86	16	166	32	1,120
St. Francis Hospital‡	Gen	Church	100	16	209	60	1,702
Galesburg, 28,830—Knox							
Galesburg, Cottage Hospital‡	Gen	NPAssn	82	18	184	33	1,094
St. Mary's Hospital	Gen	Church	120	16	182	32	1,263
Geneseo, 3,406—Henry							
J. C. Hammond City Hospital	Gen	City	25	5	31	7	310
Genova, 4,607—Kane							
Community Hospital‡	Gen	NPAssn	67	18	175	28	849
Granite City, 25,130—Madison							
St. Elizabeth Hospital‡	Gen	Church	103	22	123	54	1,714
Harrisburg, 11,625—Saline							
Harrisburg Hospital	Gen	Corp	30	1	8	7	380
Lightner Hospital	Gen	Indiv	35	5	38	18	1,015
Harvard, 2,988—McHenry							
Harvard Community Hospital	Gen	Part	21	5	35	6	200
Harvey, 16,374—Cook							
Ingalls Memorial Hospital‡	Gen	NPAssn	95	25	351	37	1,817
Herrin, 9,708—Williamson							
Herrin Hospital	Gen	Part	40	5	39	17	584
Highland, 3,319—Madison							
St. Joseph's Hospital	Gen	Church	70	7	98	42	978
Highland Park, 12,203—Lake							
Highland Park Hospital	Gen	NPAssn	53	17	204	21	1,041
Hillsboro, 3,435—Montgomery							
Hillsboro Hospital	Gen	NPAssn	30	5	45	15	448
Hines,—Cook							
Veterans Admin. Facility	G&TB	Vet	1,750	..	..	1,642	5,549
Hinsdale, 6,923—Du Page							
Hinsdale Sanitarium and Hospital‡	Gen	NPAssn	105	5	134	40	1,060
Jacksonville, 17,747—Morgan							
Jacksonville State Hospital‡	Ment	State	3,345	..	..	3,283	779
Morgan County Tuberculosis Sanatorium	TB	County	40	..	..	21	41
Norbury Sanatorium	N&M	Corp	125	..	..	53	135
Our Savior's Hospital‡	Gen	Church	82	10	118	45	1,200
Passavant Memorial Hosp.‡	Gen	Church	73	12	87	31	844
Joliet, 42,993—Will							
St. Joseph's Hospital*‡	Gen	Church	192	36	530	145	3,793
Silver Cross Hospital‡	Gen	NPAssn	133	17	261	61	2,647
Will County Tuberculosis Sanatorium	TB	County	100	..	..	76	50
Kankakee, 20,620—Kankakee							
Kankakee State Hospital*†‡	Ment	State	4,000	..	..	4,046	1,423
St. Mary Hospital‡	Gen	Church	114	12	145	47	1,418
Kenilworth, 2,501—Cook							
Kenilworth Sanitarium	N&M	Indiv	26	..	..	16	22
Kewanee, 17,093—Henry							
Kewanee Public Hospital‡	Gen	NPAssn	50	12	125	25	849
St. Francis Hospital‡	Gen	Church	56	11	109	40	700
La Harpe, 1,175—Hancock							
La Harpe Hospital	Gen	NPAssn	15	3	25	5	160
Lake Forest, 6,554—Lake							
Alice Home Hospital	Gen	NPAssn	42	8	93	15	694
La Salle, 13,149—La Salle							
St. Mary Hospital‡	Gen	Church	85	15	237	35	1,156
Libertyville, 3,791—Lake							
Condell Memorial Hospital	Gen	NPAssn	25	6	35	6	286
Lincoln, 12,855—Logan							
Evangelical Deaconess Hosp.‡	Gen	Church	53	8	79	34	966
St. Clara's Hospital	Gen	Church	63	9	44	25	875
Litchfield, 6,612—Montgomery							
St. Francis Hospital	Gen	Church	125	8	112	77	2,357
Mackinaw, 760—Tazewell							
Oak Knoll Sanatorium	TB	County	45	..	..	36	56
Macomb, 8,509—McDonough							
Marietta Phelps Hospital‡	Gen	Corp	40	6	51	16	590
St. Francis Hospital‡	Gen	Church	80	10	112	30	1,130
Manteno, 1,149—Kankakee							
Manteno State Hospital	Ment	State	1,201	..	..	1,186	118
Mattoon, 14,631—Coles							
Memorial Methodist Hospital‡	Gen	Church	43	8	56	31	1,000
Melrose Park, 10,741—Cook							
Westlake Hospital	Gen	Corp	85	16	157	16	822
Mendota, 4,008—La Salle							
Harris Hospital	Gen	Indiv	20	3	21	5	232
Moline, 32,236—Rock Island							
Lutheran Hospital‡	Gen	Church	135	36	321	50	1,400
Moline Public Hospital‡	Gen	City	111	22	289	42	1,901
Monmouth, 8,666—Warren							
Monmouth Hospital‡	Gen	City	33	10	111	23	682
Morris, 5,568—Grundy							
Morris Hospital	Gen	NPAssn	34	10	84	9	388
Mt. Vernon, 12,375—Jefferson							
Mt. Vernon Hospital	Gen	Indiv	20	..	20	11	450

	Type of Service	Control	Beds, Rated Capacity	Bassinets	Number of Births	Average Patients	Patients Admitted
Mowequa, 1,478—Shelby							
Mowequa Hospital	Gen	Indiv	25	8	19	11	90
Murphysboro, 8,182—Jackson							
St. Andrew's Hospital	Gen	Church	50	4	24	35	553
Naperville, 5,118—Du Page							
Edward Sanatorium	TB	NPAssn	88	..	..	55	103
Normal, 6,768—McLean							
Brokaw Hospital‡	Gen	Church	85	15	124	44	1,788
Fairview Sanatorium	TB	County	50	..	..	24	12
North Chicago, 8,466—Lake							
Veterans Admin. Facility	Ment	Vet	1,125	..	..	1,046	187
Oak Forest, 50—Cook		*County*	*1,054*	..			
Cook County Infirmary	Gen					No data supplied	
Cook County Tuberculosis Hospital	TB	County	634	..	..	493	669
Oak Park, 63,982—Cook							
Oak Park Hospital*‡	Gen	Church	125	40	556	90	3,037
West Suburban Hospital*†‡	Gen	NPAssn	327	100	992	107	5,040
Olney, 6,140—Richland							
Olney Sanitarium‡	Gen	Corp	68	7	52	45	1,631
Ottawa, 15,094—La Salle							
Highland	TB	*County*	*60*	..	..	29	47
Ottawa Tuberculosis Sanat.	TB	Corp	115	..	..	84	144
Ryburn Memorial Hospital‡	Gen	City	58	12	201	36	1,269
Pana, 5,835—Christian							
Huber Memorial Hospital‡	Gen	Church	50	12	53	22	788
Paris, 8,781—Edgar							
Paris Hospital‡	Gen	Corp	40	6	22	32	712
Pekin, 16,129—Tazewell							
Pekin Public Hospital	Gen	NPAssn	40	8	138	26	1,073
Peoria, 104,969—Peoria							
John C. Proctor Hospital‡	*Gen*	*NPAssn*	*100*	*18*	*181*	*51*	*1,873*
Methodist Hospital of Central Illinois‡	Gen	Church	130	23	474	107	3,583
Michell Farm	N&M	Indiv	26	..	..	14	32
Peoria Municipal Tuberculosis Sanitarium	TB	City	93	..	..	92	116
Peoria Sanitarium	N&M	Indiv	25	..	..	10	60
Peoria State Hospital‡	*Ment*	*State*	*2,771*	..	..	*2,712*	*846*
St. Francis Hospital*‡	Gen	Church	300	30	619	183	4,752
Peru, 9,121—La Salle							
Peoples Hospital‡	Gen	NPAssn	50	10	125	26	1,088
Pontiac, 8,272—Livingston							
Livingston County Sanatorium	TB	County	36	..	..	36	45
St. James' Hospital	Gen	Church	40	12	152	14	920
Princton, 4,762—Bureau							
Julia Backley Perry Memorial Hospital	Gen	City	40	6	76	16	769
Quincy, 39,241—Adams							
Blessing Hospital‡	Gen	NPAssn	125	20	265	72	2,182
Hillcrest	TB	County	50	..	..	43	46
St. Mary Hospital*‡	Gen	Church	195	20	408	124	3,471
Rantoul, 1,555—Champaign							
Station Hospital	Gen	Army	50	1	5	11	392
Red Bud, 1,208—Randolph							
St. Clement's Hospital	Gen	Church	22	2	13	12	222
Robinson, 3,668—Crawford	Gen						
Robinson Hospital		Part	18	3	13	3	114
Rockford, 85,864—Winnebago							
Rockford Hospital‡	Gen	NPAssn	92	18	164	36	1,607
Rockford Municipal Tuberculosis Sanatorium†	TB	CyCo	110	..	..	90	101
St. Anthony's Hospital*‡	Gen	Church	180	35	412	80	2,809
Swedish-American Hospital‡	Gen	NPAssn	80	12	170	36	1,242
Wilgus Sanitarium	N&M	Indiv	35	..	..	12	120
Winnebago County Hospital	GenIso	County	90	6	122	66	1,690
Rock Island, 37,953—Rk. Island							
Rock Island County Tuberculosis Sanatorium	TB	County	76	..	..	58	74
St. Anthony's Hospital*‡	Gen	Church	150	18	160	62	1,645
Rosiclare, 1,794—Hardin							
Rosiclare Hospital	Gen	Indiv	10	2	10	3	102
Rushville, 2,388—Schuyler							
Culbertson Hospital	Gen	Indiv	25	5	8	4	168
St. Charles, 5,377—Kane							
St. Charles City Hospital	Gen	NPAssn	20	6	41	5	192
Sandwich, 2,611—De Kalb							
Horatio N. Woodward Memorial Hospital	Gen	NPAssn	26	10	70	10	268
Savanna, 5,086—Carroll							
Savanna Public Hospital	Gen	City	14	5	26	4	144
Shelbyville, 3,491—Shelby							
Shelby County Memorial Hosp.	Gen	County	18	5	22	9	211
Springfield, 71,864—Sangamon							
Palmer Sanatorium	TB	Corp	60	..	..	37	99
St. John's Hospital‡	Gen	Church	568	32	984	361	11,103
St. John's Sanitarium	TbOr	Church	325	..	No data supplied		
Springfield Hospital‡	Gen	NPAssn	85	15	227	56	1,593
Spring Valley, 5,270—Bureau							
St. Margaret's Hospital‡	Gen	Church	68	7	96	36	1,093
Sterling, 10,012—Whiteside							
Public Hospital‡	Gen	City	51	12	176	24	937
Streator, 14,728—La Salle							
St. Mary's Hospital	Gen	Church	100	12	202	56	2,206
Sublette, 261—Lee							
Angear Maternity Hospital	Mat	Indiv	10	6	29	3	504
Sycamore, 4,021—De Kalb							
Sycamore Municipal Hospital	Gen	City	23	7	51	11	357
Taylorville, 7,316—Christian							
St. Vincent Hospital‡	Gen	Church	55	11	125	36	1,342
Urbana, 13,060—Champaign							
Carle Memorial Hospital	Gen	Corp	25	6	39	15	708
Champaign County Hospital	Gen	County	55	8	84	15	706
Mercy Hospital‡	Gen	Church	38	12	183	37	1,842
The Outlook	TB	County	48	..	..	35	29
Vandalia, 4,342—Fayette							
Mark Greer Hospital	Gen	Indiv	20	6	62	16	575
Waterman, 520—De Kalb							
East Side Hospital	Gen	Indiv	25	7	53	13	343
Watseka, 3,144—Iroquois							
Iroquois Hospital‡	Gen	County	30	8	79	20	761
Waukegan, 33,499—Lake							
Lake County General Hospital	Gen	County	90	15	No data supplied		
St. Therese's Hospital‡	Gen	Church	135	16	314	44	2,296
Victory Memorial Hospital‡	Gen	NPAssn	76	14	212	24	1,022
Winfield, 445—Du Page							
Winfield Sanatorium	TB	NPAssn	120	..	..	89	126
Zace Sanatorium	TB	Corp	50	..	..	20	60
Woodstock, 5,471—McHenry							
Woodstock Public Hospital	Gen	NPAssn	20	7	36	7	311
Zeigler, 3,816—Franklin							
Zeigler Hospital	Gen	NPAssn	18	2	5	3	92

RELATED INSTITUTIONS

Aledo, 2,203—Mercer							
Aledo Hospital	Gen	Indiv	10	2	14	3	113
Arrowsmith, 279—McLean							
L. M. Johnson Hospital	Gen	Indiv	10	2	7	2	48
Augusta, 1011—Hancock							
Augusta Hospital	Gen	NPAssn	12	3	No data supplied		
Chicago, 3,376,438—Cook							
Beverly Hills Rest Home	Conv	Indiv	7	..	..	4	18
Chicago Home for Convalescent Women and Children	Conv	NPAssn	53	..	..	51	476
Chicago Home for Incurables	Inc	NPAssn	296	..	..	288	68
Ellis Avenue Rest Home	Conv	Indiv	18	..	..	9	66
House of Correction Hospital	Gen	City	75	..	..	50	2,117
Illinois Steel Company Hosp.	Indus	NPAssn	25	..	..	11	48
Infirmary of Clearing House							
Illinois Emergency Relief	Gen	State	350	..	..	..	..
Isolation Hospital	SmPox	City	35	..	..	..	14
Lawrence Hall	Inst	Church	15	..	..	3	150
Marks Nathan Jewish Orphan Home	Inst	NPAssn	23	..	..	4	1,533
Methodist Episcopal Old People's Home	Inst	Church	25	..	..	21	..
Mylan Sanitarium	N&M	Indiv.	15	..	..	5	35
St. Mary of Providence Institute	MeDe	Church	110	..	..	90	36
Salvation Army Women's Home and Hospital	Mat	Church	22	12	190	14	307
Washington and Jane Smith Home	InstGen	NPAssn	21	..	..	9	103
Dixon, 9,903—Lee							
Dixon State Hospital‡	MeDe	State	3,323	10		11	3,102 545
Eldorado, 4,482—Saline							
Ferrell Hospital	Gen	Indiv	16	1	No data supplied		
Evanston, 63,338—Cook							
The Cradle	Chil	NPAssn	..	24	..	22	272
Grove House for Convalescents	Conv	NPAssn	38	..	..	17	162
Fairbury, 2,310—Livingston							
Fairbury Hospital	Gen	NPAssn	8	4	36	3	176
Flora, 4,393—Clay							
Flora Hospital	Gen	Indiv	7	2	20	4	208
Geneva, 4,607—Kane							
State Training Schl. for Girls	Inst	State	17	25	..	15	312
Godfrey, 201—Madison							
Beverly Farm	MeDe	Corp.	75	..	..	59	9
Henry, 1,658—Marshall							
Drs. Coggeshall and Dysart Hospital	Gen	Part	7	4	24	3	145
Hinsdale, 6,923—Du Page							
West Suburban Home for Girls	Mat	NPAssn	20	16	31	6	34
Jacksonville, 17,747—Morgan							
Illinois School for the Blind	Inst	State	20	..	..	4	153
Illinois School for the Deaf	Inst	State	40	..	..	7	396
Lincoln, 12,855—Logan							
Lincoln State School and Colony‡	MeDe	State	3,777	6		17	3,452 367
Mattoon, 14,631—Coles							
Independent Order Odd Fellows Old Folks Home Hosp.	Inst	Frat	54	..	..	40	120
Menard, 22—Randolph							
Illinois Security Hospital	Ment	State	525	..	..	506	65
Southern Illinois Penitentiary Hospital		State	36	..	..	18	499
Metropolis, 5,573—Massac	Inst						

(Continued on page 191)

Original Articles

THE ROLE OF SURGERY IN THE DISEASES OF THE THYROID

MARTIN NORDLAND, M. D.

MINNEAPOLIS, MINN.

For thousands of years, goiter has been a familiar malady, an unsightly and frequently fatal diease and accepted as an inoperable affliction in communities where it prevailed. In the words of Halsted, in his operative story of goiter, "This conspicuous tumor of the neck was a perpetual challenge to the physician and a stigma as well to the surgeon."

Before the era of aseptic surgery the thyroid was regarded with an amount of respect which discouraged operative intervention, a fact which was manifested by the prohibition of operations on goiter by the French Academy of Medicine as late as 1850. This precaution was apparently justified by the dangers encountered on account of the abundant blood supply of the thyroid when altered by disease and the intimate relation of the gland to the trachea, as well as the fact that the operative mortality was about forty per cent. Principally through the work of Billroth, Kocher, Halsted and deQuervain, it is more than fifty years since operations on goiters have acquired a position among the accepted procedures of surgery. The operative mortality has now been reduced to less than one per cent.

While thyroidectomy is a procedure which today can be carried out technically by any competent operator without danger of mishap, still it is an operation which many surgeons even now undertake with considerable apprehension. To deal intelligently with the problem, one cannot expect surgical treatment alone to effect cures. Problems beyond the immediate operative mortality enter into the question. While technical complications, such as injury to the recurrent laryngeal nerves and parathyroid bodies must be avoided, the patient must also have a good looking scar and a good functional result. A preexisting hypo or hyperthyroidism may be present to render the surgeon's task more difficult. Sufficient thyroid tissue must be left for future requirements, but, at the same time, sufficient tissue must be removed to guard against future recurrence. Derangement of function of various systems by the secretions of an abnormal thyroid gland introduce a problem which is more indefinite, although just as important as the surgical anatomy of the thyroid region or the technique of thyroidectomy. Because of these varied problems, the entire field of medicine with all its specialties is concerned with one or more phases of these complications. There is no branch of surgery where good judgment is more essential than in the surgery of the thyroid gland.

The indications for the operative treatment of goiter, besides that of hyperfunction, are the removal of adenomata to improve the appearance of the neck, the relief of symptoms of tracheal compression caused by simple nodular goiters, as well as the prophylaxis and cure of malignancy and other pathological changes. Consideration should be given to the esthetic aspect of the disease raised by the patient since a goiter which is unsightly is nearly always clinical as well, very often involving the trachea and large blood vessels of the neck with harmful effects on the patient. Changes in size or contour of the thyroid gland causing cosmetic disturbances or pressure on the recurrent laryngeal nerves or those resulting in substernal and intrathoracic projections of gland tissue are, as a rule, readily diagnosed and their treatment is just as readily indicated. In this type of case roentgenographic as well as laryngoscopic examination are of considerable importance in the preoperative management and in the surgical treatment of the disease. It has been estimated that in all instances in which the goiter has produced symptoms of a mechanical nature, damage results to one or the other of the vocal cords in about five per cent. of cases.

There are some conditions, namely, chronic thyroiditis of Riedel's struma type, tuberculosis and cases in which there has been a sudden hemorrhage into a benign adenoma, which are often confused with malignant tumors of the thyroid. A correct preoperative diagnosis is most important in the surgical management of these cases. In the differential diagnosis, the most noteworthy, although rare, is the so-called Riedel's struma, or woody thyroiditis. The etiology of this disease has been variously ascribed to tuberculosis, syphilis, and other types of chronic

Oration on Surgery, Eighty-fifth Annual Meeting, Illinois State Medical Society, Rockford, May 22, 1935.

inflammation, but no convincing evidence of any of these factors has been presented. In this disease the gland is so hard that its consistence has been described as stony or iron-like. However, its contour is smooth and rounded, the normal shape of the gland is retained, there is no hoarseness and there is little or no fixation of the gland to surrounding structures. There is no evidence of extension to regional nodes and distant organs. Malignant tumors are usually nodular and unilateral, they frequently metastasize early and soon involve the recurrent laryngeal nerves so that hoarseness and dyspnea are relatively common symptoms. The indications for surgical removal of the gland affected by woody thyroiditis consist mainly of pressure symptoms such as dyspnea and dysphagia. When surgery is undertaken for this disease it should, if possible, be limited to partial resection of the gland, since, as a rule, very little functioning gland tissue is left and myxedema may result. Late in the disease myxedema is common but this may be controlled satisfactorily by the oral administration of thyroid gland extract.

Tuberculosis of the thyroid, while extremely rare and of little clinical importance, is occasionally confused with malignancy. It has been noted that tuberculosis occurs frequently in association with increased functional activity of the gland already involved with hyperthyroidism. Whether the hypertrophic gland is rendered more susceptible to invasion by the bacillus of tuberculosis, or whether the infection stimulates the parenchyma to abnormal activity resulting in hyperthyroidism has not been determined. The disease is most frequeutly a part of a generalized tuberculosis or secondary to tuberculous infection elsewhere in the body. The result may either be a frank abscess formation or a chronically inflamed fibrotic mass. Microscopically the latter type shows tubercles intra- or interfollicularly. The surgical treatment is incision of the abscess or lobectomy, depending upon the condition encountered, and the prognosis is excellent.

In most cases of hemorrhage into a thyroid adenoma the history gives a correct diagnosis, whether the patient had previously noted a goiter or not, the thyroid suddenly increases definitely in size. This swelling, of a rapid onset, is associated with marked local tenderness and occasionally by symptoms of choking and pressure in the neck. Because the tumor following hemorrhage usually tends to subside over a period of a few days or weeks, it is readily differentiated from malignancy.

Malignant tumors of the thyroid are not extremely rare since the statistical studies show that from one to three per cent. of all nodular growths in this gland are carcinoma. The greatest hope of cure of malignant lesions of the thyroid lies in the prophylactic removal of adenomas. The usually quoted text-book symptoms of cancer of the thyroid are really those of the end-stages of the disease. A rapidly growing goiter with irregular lobulation distorting the usual symmetrical shape of the thyroid gland is rarely present until the condition is hopeless.

According to most investigators malignancy of the thyroid arises in about ninety per cent. of the cases in a preexisting nodular goiter, usually in an individual in the 5th or 6th decade. As long as the growth remains inside the capsule, no symptoms are produced, so the exact time at which the malignancy begins cannot be determined. The goiterous enlargement is occasionally the only symptom of which the patient is aware. Pressure on the recurrent laryngeal nerve or direct extension of the growth into the trachea results in hoarseness and cough, and, if the esophagus is encroached upon, dysphagia is present. Hoarseness is a significant symptom since it usually means that the tumor has broken through the capsule and that the nerve is actually invaded or pressed upon. In non-malignant tumors of the neck, involvement of the recurrent laryngeal nerve is very rare.

The question of the possibility of carcinomatous lesions of the thyroid producing hyperthyroidism has not been completely settled although Pemberton states that this condition practically never takes place. When there is enlargement of the gland with hyperthyroidism, malignancy is rare, although in Pemberton's series, eighty-seven per cent. of the cases of malignancy were associated with benign nodules elsewhere in the gland. It is these benign adenomas which are most likely the cause of the hyperthyrodism. In many instances operations are undertaken for supposedly benign adenomatous goiters only to find, by immediate microscopic examination or recurrence of the lesion at a later date, that the neoplastic change had already taken place. Need-

less to say, it is in these cases that are not diagnosed clinically that the best results may be expected. In early cases in which the carcinoma is confined within the capsule, removal of all of the growth without rupture of the capsule is sufficient. After malignancy has been diagnosed, the treatment of choice is radical resection, and, if this is impossible, irradiation alone or combined with surgical removal is strongly indicated. In inoperable cases, supplementary treatment consisting of checkerboarding the region of the thyroid gland and applying radium in a mild erythema dose is usually necessary. High voltage roentgen ray treatment may also be used in addition.

In summary, it may be stated that surgery alone in this condition is usually not justifiable even if the malignant lesion is entirely removed, although, in many instances, radical resection has proved satisfactory. The latter is especially true of the papillary adeno-carcinoma which grow slowly, and tend to remain encapsulated for a long time. In the more malignant types, radiotherapy certainly offers additional protection against the extension of the disease. Tracheotomy is frequently necessary, especially in the late stages of the disease, as a palliative measure.

The prognosis of carcinoma of the thyroid has been shown by Pemberton and Fricke and others to be as good as that of similar lesions of any other organ with the exception of the lip and the skin. Of 323 cases treated by them with a combination of surgery and irradiation, 5-year cures were effected in 43.9 per cent. Twenty per cent. of these individuals lived ten years.

Since the very earliest recognition of exophthalmic goiter, surgery, supplemented by supportive and protective measures, has been the most successful method of combating the disease. Nevertheless, for many years serious obstacles have impeded the progress of surgery in this field. Due to the complicated nature of its problems, the high operative mortality and the lack of understanding of the cause of death, many surgeons were unwilling to undertake the operation. In fact, it is only within the past twenty years that the surgery of hyperthyroidism has become a relatively simple and safe procedure. The successful outcome of operations in other branches of surgery, including simple nodular goiter, was almost wholly dependent on the perfection of technical measures and asepsis. The operative mortality in the removal of adenomatous goiter with hyperthyroidism is mainly dependent upon the condition of the heart and kidneys or some constitutional disorder, while in exophthalmic goiter the severity of the intoxication constitutes the additional and often the greater risk. Adherence to a faultless technic and rigid asepsis often fail to avert disaster. The mortality rate has always been in the past, and still is at the present, as much from crisis as all other deaths in thyroid surgery.

It is now conceded that the most efficacious method of treatment of exophthalmic goiter is one which combines both medical and surgical measures. Alone, either will be found inadequate for the great majority of cases. They call for constant and closest cooperation between the internist and the surgeon from the beginning of the treatment. The consensus of opinion to date is that the greater majority of patients with hyperthyroidism should first have a period of medical treatment and later be subjected to surgical procedures.

Undoubtedly the greatest recent advance in the treatment of hyperthyroidism has come from the administration of iodine. It has been generally agreed that, in comparison with other measures, it is the most valuable drug in the treatment of this disease. It must be understood, however, that the beneficial results of medical treatment alone are at best but temporary, and that the drug treatment should be followed within a relatively short time by proper surgical procedure. Between the remission and the next exacerbation the patient remains in a state of varying degrees of hyperthyroidism which may cause considerable visceral damage. The maximal results derived from the administration of iodine are usually obtained in from ten to fourteen days, but in some cases a period of three weeks is required. A second, or even third remission may be produced with iodine but each one, after the first, is brought about with much more difficulty and is less complete than the first. According to Reinhoff, operation as soon as the first remission is established offers the best prognosis, and once this golden opportunity has been allowed to slip away another such remission can be obtained only with great difficulty, if at all.

While by far the greatest value derived from

the use of Lugol's solution has come from its employment in the preparation of patients for operation, it has also proved to be an exceptionally valuable diagnostic agent in mild and atypical cases of hyperthyroidism. Although the usually accepted range of normal variability of the basal metabolic rate is within plus and minus ten per cent. too much stress in recent years has been placed upon this single observation. Its value in the diagnosis and treatment of thyroid disturbances is most important only when the reading is extremely high or extremely low. In the cases with a basal metabolic rate varying only slightly from normal, several observations are necessary and other diagnostic factors should be given preference. This is particularly true in hyperthyroidism in children, where considerable difference of opinion exists as to what may be considered a normal rate. Since the characteristic effect of Lugol's solution is to relieve symptoms of hyperthyroidism, its use as a diagnostic agent in exophthalmic goiter is clearly indicated. A remission in the cardinal symptoms after its use and an exacerbation after the administration of the iodine has been discontinued is good evidence of the presence of hyperthyroidism in these atypical and border-line cases.

Although the use of Lugol's solution has reduced the severity of all manifestations of the disease and resulted in a smoother postoperative convalescence, there is still a group of about five per cent. of patients with exophthalmic goiter who cannot be made satisfactory surgical risks by the prolonged medical treatment. In this group, a two-stage operation is clearly indicated. A preliminary ligation of one or more of the thyroid arteries, as formerly done by Kocher, will so improve the patient's condition that the gland can be resected later without the danger of an acute reaction.

Roentgenotherapy has frequently been suggested in these and other cases of hyperthyroidism. While it is admitted that in a large number of cases treated by x-ray there is a gradual diminution in the basal metabolic rate and a general improvement of the patient, radiotherapeutic methods have several serious drawbacks. The dosage is difficult to determine. The favorable result in the beginning may, due to the cumulative action of the x-rays, eventually prove to be excessive. This treatment has none of the precision of the operative treatment. Further, radiotherapy is contraindicated in those cases of goiter which, sooner or later, come to operation. The inherent difficulties of an operation for exophthalmic goiter are increased to such an extent by the x-ray as to almost render the operation impossible. The adhesions after x-ray treatment are only to be compared in many cases to those produced by previous thyroidectomy in exophthalmic goiter and usually they are more marked. Further, a most important objection to x-ray treatment is the fact that visceral damage continues to advance while the gland is being treated and, in many instances, reaches a dangerous degree before it can be controlled.

In spite of the benefits of surgery in toxic goiter, recurrence of toxicity as well as persistence of symptoms occur in about five per cent. of cases. The cause of recurrent symptoms following operation for exophthalmic goiter has not been fully explained. Various theories, as well as carefully conducted studies along this line, have been reported, but as yet no satisfactory reasons have been established as why, in an occasional instance, recurrence of hyperthyroidism takes place at varying intervals following thyroidectomy. It is true that in many cases the cause of recurrence of the goiter can be definitely traced to incomplete removal of the gland, such as in hemithyroidectomy or in instances in which retrotracheal extensions are overlooked. Yet, there remains a certain definite group of patients in which minimal amounts of gland tissue are preserved and return of symptoms is noted.

Classification of these recurrences, therefore, can readily be made on the basis of whether the previous removal of the gland was adequate or inadequate, and, of course, the proper treatment in the latter type of case is prophylaxis. This consists in a thorough removal of the gland, including the isthmus and also the pyramidal lobe, if present, leaving only a thin layer on the posterior capsule and taking care to locate and resect any retrotracheal extensions. This procedure will prevent most, but not all, recurrences, and it is in this latter type of case that one cannot attribute a return of the goiter to inadequate or incomplete surgery.

The amount of gland tissue left behind obviously cannot be estimated to a very exact degree. If this were necessary, then good results from

thyroidectomy would be few and far between, because the surgeon would have to possess either extremely accurate methods to judge this amount or he would have to have great intuition to know how much tissue was to be preserved. In other words, most cases of thyroidectomy would result in either postoperative myxedema or persistent hyperthyroidism unless a very definite exact amount of tissue were left behind.

It seems then, from evidence obtained by observations of these recurrent cases, that the gland tissue which is preserved regains the power of regulating the function for which the thyroid is responsible, and it can meet demands made upon it so that an apparently normal response takes place. The large proportion of cures in exophthalmic goiter gives strong evidence of this fact. As Pemberton and others have emphasized, thyroidectomy breaks a link somewhere in the chain of endocrine functions so that a normal balance between these organs is usually restored. He also points out the fact that in about forty per cent. of these cases of recurrent hyperthyroidism some predisposing etiologic factor seems to be present, such as a cold, influenza, overwork, worry, fright, shock, pregnancy, or an operation. However, as to their actual significance there is some doubt.

In only a few cases a partial return of some of the signs of hyperthyroidism is present and it is in these cases especially that therapeutic measures fail. In a certain group of cases, exophthalmos, frequently hardly noticeable preoperatively, becomes more and more progressive following removal of the gland so that permanent damage seems a likely factor in the production of these changes. The pathologic change responsible for this condition, as determined by Naffziger and Jones, is of mechanical origin, and, as described by them, is the result of pronounced swelling of the extraocular muscles to from three to eight times their normal size. They recommend, for these cases of progressive exophthalmos following thyroidectomy, removal of the roofs of the orbit through bilateral frontal bone flaps.

General Surgical Consideration. In the surgery of the thyroid, as in other operative procedures, the surgeon may follow no premeditated plan of attack, merely excising goitrous tissue and accomplishing hemostasis as removal of the gland progresses; or, he may ligate and interrupt the main blood supply to the gland by means of small preliminary procedures and thus quickly convert the process into a methodical one in which anatomical structures are more easily and readily recognized and their disposition sooner decided upon. Preliminary hemostasis of this type, which is especially important in thyroid surgery because of the extraordinarily abundant blood supply to the gland, has been found by the author to be well worth the few minutes required for its execution. By this method it is possible to interrupt the blood supply to the thyroid gland from all four of its arteries without detrimental effect to the parathyroid bodies and with little danger of injury to the recurrent laryngeal nerves.

While the technic of thyroidectomy has been so perfected that, together with supportive preoperative and postoperative management, mortality rates have been decreased to less than one per cent., nevertheless the intimate relationship of the gland to the laryngeal nerves or parathyroid glands, hemorrhage and infection do occasionally occur in the experience of even the most skilled surgeons. This is readily understood when one considers the intimate relationship of the bland to the trachea, larynx, superior and recurrent laryngeal nerves, large vessels of the neck and to the parathyroid bodies, and various degrees of injury frequently occur in attempts to apply clamps and ligatures to thyroid vessels. It is with the idea of preventing these annoying and often serious complications and not so much of decreasing mortality rates, that preliminary to thyroidectomy, extrafascial ligation of the inferior thyroid arteries is described and heartily recommended in this communication. The importance of an accurate knowledge of the anatomy of this region cannot be over-emphasized, because by a methodical and careful anatomical dissection structures may be accurately defined and the advantages of hemostasis gained.

Anatomical Considerations. The factors directly related to the problem of hemostasis in thyroidectomy are based upon an accurate knowledge of the anatomic relations obtaining in the neck. The relations of the larynx are especially important in goiter surgery because of the intimate proximity of this organ to the thyroid; and

injury to this structure may be very serious as well as of a permanent nature.

From a study of the relations of the thyroid gland and the larynx made by dissections of 31 cadavers in the Department of Anatomy at the University of Minnesota, several conclusions were arrived at which are at variance with the usual descriptions found in the standard text-books of anatomy. It was found that the superior laryngeal nerve, in addittion to carrying sensory fibers to the mucous membrane of the larynx, also contains motor filaments to the interarytenoid muscles. These studies likewise showed that the recurrent laryngeal nerves are found lying in a position farther from the tracheoesophageal groove than is usually described, and it was further disclosed by these dissections that the relations of the recurrent laryngeal nerve to the inferior thyroid artery are the same on each side of the neck. These relations have been previously described.

The value of the method of hemostasis suggested by the author is further emphasized by the anatomical relations showing the proximity of the recurrent laryngeal nerves to the corresponding inferior thyroid arteries as they ascend laterally in the tracheoesophageal groove to enter the larynx. It can be appreciated how attempts at ligature of this artery can more easily result in disaster to the nerve when carried out through an intracapsular approach than when done extrafasically. In addition to a lessened hazard to the nerve through this approach, it is clear that ligature of the main arterial trunk, rather than one of its branches, is much more likely to be secured, and this obviously possesses distinct advantages in maintaining hemostasis during any following surgical procedure which the operator may choose to carry out.

Ligature of the superior pole is not without danger of impairment of motor functions of the larynx. The superior laryngeal nerve, located a little above the outer surface of the inferior constrictor muscle of the pharynx, gives off an internal branch which supplies the interarytenoid muscle, a constrictor of the larynx by which phonation is accomplished through approximation and adduction of the vocal cords. Furthermore, an external branch of the superior laryngeal nerve innervates the cricothyroid muscle, the interruption of which, according to Jackson and Coates, renders the voice rough, weak and easily fatigued. It is thus obvious that injury to the superior laryngeal nerve, which may easily be done during polar ligations, can result in varying degrees of aphonia or disturbances in the quality of the voice. The value of hemostasis based on an accurate and careful anatomical dissection is again emphasized.

Technic of Extrafascial Ligation of the Inferior Thyroid Artery. The usual type of goiter incision is made and the flaps containing the platysma and superficial fascias are reflected upward and downward. The medial border of the sternocleidomastoid muscle is dissected free in its lower midportion and the margins retracted outward. Directly underneath are now exposed the fascia of the prethyroid muscles and at the margin of the sternomastoid a vertical slit about three centimeters in length is made in the superficial layer of the deep cervical fascia. The outer cut edge of this fascia is retracted laterally and the index finger is next carried carefully posteriorly until it is possible to palpate the transverse processes of the cervical vertebrae. The inferior thyroid artery is then found running medially at right angles from the carotid artery at the level of the sixth cervical vertebra. This level is marked as a rule by a small tubercle on the vertebral body. Linen on a carrier is then readily placed about the artery and the vessel is ligated.

Graphic illustration as to the anatomical structures encountered in the extrafascial ligation of the inferior thyroid artery is shown in the accompanying transverse section of the neck. The marked advantages of the extrafascial route to the artery are distinctly emphasized. Hemostasis is more complete, chances of injury to the recurrent nerve are decreased, and the ligation itself can be done easier in a cleaner field.

Ligation of the Superior Pole of the Thyroid Gland. In further application and carrying out of the principle of hemostasis preliminary to the actual removal of the thyroid gland, brief reference will be made to technic of ligation of the superior pole and of the superior thyroid artery. As previously emphasized, voice changes may follow superior pole ligations if great care is not taken to avoid the superior laryngeal nerve while applying the ligature. The superior laryngeal nerves usually enter the larynx at a point slightly

above the level at which the artery enters the gland and lie on the outer surface of the inferior constrictor of the pharynx. Hemostasis can thus be best accomplished, with a view to interrupting this source of blood supply and still avoiding these nerves, by application of a ligature in the following manner: a carrier containing either linen or catgut, as the surgeon may choose, is thrust around the superior pole, starting from the trachea and proceeding to the lateral margins of the gland. For this purpose it has been found that blunt ligature carriers are superior to the application of artery forceps inasmuch as the latter are easily torn off or displaced during any subsequent operative procedure. Serious hemorrhage may occasionally result before the bleeding vessel is secured. It is advantageous to guide the carrier with the finger in order to include only the amount of tissue desired. Ligation may be made in this manner either doubly or singly without danger to the superior laryngeal nerve, a constant menace when the artery itself is dissected out at a high level. An additional advantage in ligation of the superior pole consists in the preservation of the healthiest part of the gland itself, because the most normal portion of the gland is located in this area. However, if it is desired to ligate only the vessels at the superior poles without inclusion of goiter tissue, a procedure frequently called "ultra" ligation, the method of using a carrier still retains the same advantages as those described for polar ligation.

It must be borne in mind that a ligation applied high on the vessels or around the horn in extremely large glands which have pushed themselves upward, endangers the superior laryngeal nerve, the internal branch of which enters the larynx through the thyrohyoid membrane. Injury to this nerve is more probable when clamps are applied.

General Considerations. Injury to the recurrent laryngeal nerves occurs most frequently in the clamping and ligating of blood vessels during resection of gland tissue. Therefore, if control of hemorrhage can be carried out preliminary to thyroidectomy, a factor of safety is added in which there is a definitely decreased incidence of injury to the nerves. This is no small item when one considers the possible dangers, especially if the nerves on both sides are injured or cut.

In the ligation of the inferior and superior thyroid arteries the question of maintenance of adequate blood supply to the parathyroid gland presents itself. A frequently stated objection, namely, that by this procedure the nutrition of these glands is said to be impaired, has probably played a most important role in discouraging a great many surgeons from carrying out a complete program of hemostasis such as is here suggested. Regarding the blood supply of these small but important organs, it may be stated that by both laboratory and clinical studies the question has been definitely settled that no damage results following ligation of all four main arteries. Abundant collateral blood supply to the parathyroids has been demonstrated by injection of the aorta after ligature of all four arteries; and in dissections of the neck, arteries adequate to supply these glands can be found. Clinically, many series of cases have been reported in which tetany has not developed after complete hemostasis has been done by the method described. In our own cases in which all four arteries were ligated, in not a single instance has parathyroid tetany resulted.

Advantages characterizing the procedure of preliminary ligation of the inferior thyroid can be readily appreciated by observation of the gland immediately after tying the artery. A full half or two-thirds of the gland becomes dark, the capsular veins collapse from interruption of their blood supply and the glandular tissue itself shrinks markedly in size. Decrease in size of the gland takes place in many instances to such a degree that a large hyperplastic type of goiter will frequently become relatively normal in outline. In these cases any subsequent procedure which may be carried out is noticeably free of bleeding, spurting arteries are practically never encountered, and what small amounts of bleeding may take place originate mainly from the lesser veins. As a direct consequence of the decreased bleeding, fewer clamps and ligatures in the gland tissue are necessary. The speed with which the subsequent thyroidectomy is done is definitely facilitated, an important factor in treating cases in which toxicity is of a severe degree. Other factors, while of little influence regarding mortality rates, consist in a definite lessening of postoperative wound drainage, for the reason that less catgut is necessary in tying

bleeding vessels, and the chances of obtaining a satisfactory neck scar are greatly enhanced. This may be expected from the fact that draining areas from the wound are fewer and chances of secondary infection of the discharge are noticeably decreased. The latter is a point which must not be disregarded, especially in the female.

Ligation of the inferior thyroid arteries in combination with thyroidectomy affords an additional weapon in the treatment of that group of toxic goiters which recur in spite of adequate removal of thyroid tissue at the primary operation. In these individuals it is often found that at secondary operations only small amounts of thyroid tissue can be located, and frequently it is only with a great deal of hesitation that the surgeon wishes to resect the remaining portion of the gland. The authors have found that by ligation of the inferior thyroid arteries combined with subtotal thyroidectomy, results may be obtained which are definitely superior to those expected when ligation is not performed. Report of these results is being made at the present time in a separate communication.

It has been emphasized previously that injury to the recurrent laryngeal nerves takes place most frequently in those cases in which secondary operations are necessary. This is due to the fact that anatomical relations have become distorted through scar formation, resulting in displacement of the nerve into positions which are particularly susceptible to injury. This type of case again lends itself especially well to the performance of preliminary ligation of the inferior arteries as suggested above, and in the author's experience has given particularly gratifying results.

Postoperative hemorrhage, which takes place in one or two per cent. of even the most carefully done thyroidectomies, has never occurred in our experience in any instances in which preliminary ligation was performed. From this standpoint alone the procedure would seem worthwhile.

BIBLIOGRAPHY

1. Judd, E. S., and Phillips, J. R.: The Curability of Carcinoma of the Thyroid Gland. Proc. Staff Meetings, Mayo Clinic 8: 493, 1933.
2. Pemberton, J. deJ.: Malignant Diseases of the Thyroid Gland: Clinical Consideration. Ann. Surg., 87: 369, 1928.
3. Pemberton, J. deJ. and Fricke, R. E.: Treatment of Carcinoma of the Thyroid Gland, Radiology, 20: 213, 1933.
4. Pemberton, J. deJ., and Haines, Samuel F.: Hyperfunction of the Thyroid Gland, Amer. J. of Surg., 23: 399-407, 1934.
5. Rankin, F. W., and Graham, A. S.: Tuberculosis of the Thyroid Gland, Ann. Surg., 96: 625, 1932.
6. Nordland, Martin, and Larson, Lawrence M.: Postoperative Exophthalmos. Amer. J. of Surg., 23: 330-334 and 345, 1934.
7. Nordland, Martin, and Larson, Lawrence M.: Advantages and Technic of Preliminary Hemostasis in Thyroidectomy. Western Jour. of S. O. and G., 41: 485-496, 1933.
8. Nordland, Martin: The Larynx as Related to Surgery of the Thyroid Based on an Anatomical Study. Surg., Gyn. & Obst., 51: 449-459, 1930.
9. Jackson-Coates: The Nose, Ear, Throat and Their Diseases, pp. 763-772.
10. Quervain, Fritz De.: Preliminary Hemostasis in Goiter Operations. Surg., Gyn. & Obst., 33: 402-412, 1916: Goiter, 1: 149.
11. Halsted, W. S.: The Operative Story of Goiter. Balt., Johns Hopkins Press, 1919, 257 pp.

RECONSTRUCTION OF THE HIP

FREDERICK G. DYAS, M. D.

CHICAGO

The records from the Fracture Service of Cook County Hospital during the past five years showed the following results in cases of fracture of the neck of the femur.

The records of 2,000 cases of fracture of the femur during the years 1929 to 1933 inclusive were analyzed. Of these, 370 were diagnosed as fractures of the neck of the femur. One hundred ninety-eight patients were females, 53 per cent., and 172 males, 47 per cent.

The neck of the right femur was fractured in 206 or 55 per cent., the neck of the left femur in 164 or 45 per cent.

The age groups were as follows:

	Case
7 years	1
10-19 years	6
20-29 years	4
30-39 years	7
40-49 years	36
50-59 years	94
60-69 years	102
70-79 years	84
80-89 years	32
90-95 years	4
	370

Fifty-three per cent. occurred between the ages of fifty and seventy.

TYPES OF TREATMENT AND RESULTS

Treatment	Good Result	Poor Result	Undetermined	Per Cent
1. Adhesive traction with Thomas splint—102 cases..	28	54	20	28%
2. Whitman abduction cast—85 cases	40	28	17	23%
3. Bone peg or bone transplant —11 cases	6	4	1	3%
4. Metal screw or nail—5 cases	1	3	1	14%
5. Anderson splint—no cases..				

Read before the Chicago Surgical Society, March 2, 1935.

6. Adams splint—no cases....			
7. Whitman reconstruction operation—21 cases	16*	5†	14%
8. No treatment instituted—145 cases	59†		40%
	86‡		

Good results—91—24+ per cent.

*Recovered. †Died. ‡Other reasons.

As these fractures were treated by different men, no single method was used by all. How-

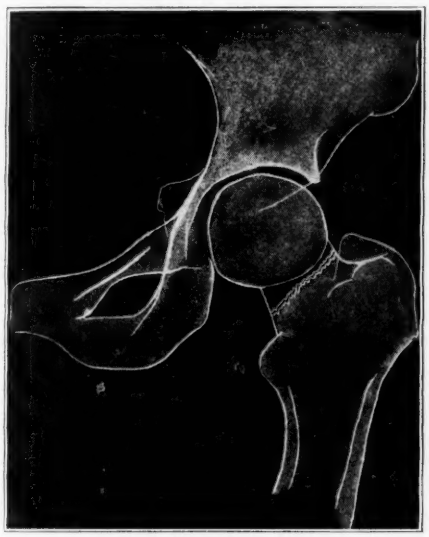


Fig. 1. Showing absorption of neck of femur.

toms could only partly be controlled by medicine. Four a No. 20 soft rubber catheter, which was placed into

ever, no effort was made to preserve the impaction when it occurred but the deformity was reduced and the fragments immobilized as in other types of fracture. Until Whitman's demonstration of the fact that the best results were obtained by breaking up the impaction with the fragments immobilized in abduction and internal rotation, the impaction was regarded as the best chance of securing union of the fragments. Because of the poor nutrition of the neck resulting from the paucity of the blood supply and the deficiency of the periosteum over the neck, failure of union occurred in 40 per cent. of cases under sixty years of age, and in over 60 per cent. of those patients over sixty years of age, regardless of the type of treatment. Among these were:

1. Simple Buck's extension.
2. Maxwell-Ruth method.
3. Lateral "T" splint with traction.
4. Thomas splint-Balkan frame.
5. Jones splint utilizing the principle of leverage with traction.
6. Anderson splint; leverage and spring traction.
7. Adams splint utilizing leverage alone.
8. Ambulatory pneumatic splint.

Since the percentage of failures was so high and as the patients were hopeless cripples and in many instances suffered constant pain, an effort was made to give these patients a useful hip-joint by the method of hip reconstruction developed by Whitman.

As all of our patients had been treated by one of the methods above mentioned, for an average of twelve weeks in bed, they were obviously not justifiable surgical risks without a period of recuperation and building up. Some of the cases were bordering upon senility and seemed hopeless at first until somewhat restored by a period of rest at home.

Because of the fact that all of these cases had been hospitalized for a period of over three months, the comparatively short period of convalescence required by the Whitman procedure made this the operation of choice. Economic pressure forced an earlier interference in some cases than seemed desirable.

The operation was carried out as follows:

An incision was carried downward, from the anterior superior spine of the ilium for a dis-

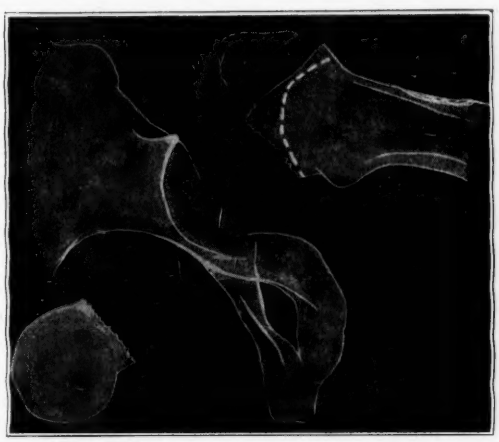


Fig. 2. Head removed from acertabulum. Great trochanter sawed off. End of shaft of femur rounded off.

tance of about four inches on the affected side, then carried posteriorly for a like distance at right angles to the first incision. An opening was found between the gluteus medius and the tensor vaginae femoris. The capsule of the joint

was exposed and found to be greatly hypertrophied in those cases in which weight bearing has been attempted in the presence of lack of union. One patient in a desperate attempt to walk with no union had forced the great trochanter almost up to the crest of the ilium, resulting in a tremendous thickening of the capsule.

The capsule was now incised and the foot released from its attachment to the traction arm of the fracture table. The leg was flexed upon the thigh and strong external rotation obtained. With a Lane elevator, the head was then pried

Fig. 3. New head in place. Great trochanter fixed to shaft.

out of the acetabulum and the ligamentum teres divided. In many instances the head was found to have undergone a high degree of absorption second only to that of the neck. Because of this softening, attempts to introduce the Lane elevator often cut deeply into the head and in some instances completely divided it. The extreme degree of absorption of the neck and head gave evidence of the difficulty in obtaining union in those cases in which dependence was put upon new bone formation (osteogenesis) for the restoration of a weight bearing neck. After removal of the head of the femur, the lower extremity was rotated inwardly in order to better exposure of the great trochanter. With a Gigli saw or a broad chisel the great trochanter, carrying with it the rotator muscles of the thigh, was separated from the shaft of the femur and reflected upward. With a bone cutting forceps the upper portion of the shaft was rounded off to serve as a head. This was then skidded into the acetabulum by traction and rotation. In most cases the newly formed head tends to remain snugly in the acetabulum without any means of fixation. A portion of the shaft was now chosen for the attachment of the great trochanter. This should be sufficiently far down on the shaft so that extreme abduction will not cause the transplanted great trochanter to impinge upon the rim of the acetabulum. The fixation was done by freshening the shaft at the point selected and then drilling holes through the trochanter and shaft through which wires were threaded and twisted up snugly. The limb was then immobilized in a double spica reaching from the nipple line to the toes on the affected side and to the knees upon the sound side with both limbs in forced abduction and internal rotation. The cast was removed at the end of four weeks and passive motion and massage begun. This is in marked contrast to the three months required by plastic operations depending upon osteogenesis for their success, in which the double spica must remain in place for twelve weeks at the minimum.

In an effort to escape the complications incidental to the Whitman cast, we used a simple Adams splint with plaster boots reaching from the knees to the toes, with both limbs in forced abduction and internal rotation, immobilized by a long wooden transverse splint incorporated in the plaster boots. Because of the fact that there is no tendency for the newly formed head to dislocate, this method of immobilization is sufficient and obviates the tortures and complications of the body cast. The Adams splint confers a surprising amount of bodily freedom upon the patient, thus escaping the dangers of hypostatic pneumonia and decubital ulcers in addition to solving the problems of nursing and the patient's toilet.

The objection that the Whitman operation does not preserve the normal anatomy of the hip-joint is more than over-balanced by the greater certainty of a weight-bearing joint and the shorter convalescence. The amount of shortening which necessarily follows the Whitman operation is not sufficient to seriously interfere with walking or weight bearing.

It is believed that because of the relative simplicity of the Whitman operation it should be resorted to in cases of non-union following a fracture of the neck of the femur except when contraindicated by extreme age, constitutional disease or local infection.

In 21 cases operated upon five died, chiefly from pneumonia, decubitus and cardiac failure, a mortality percentage of fourteen per cent.

The use of the Adams splint reduces the hazard of the operation and justifies operative interference in cases which could not be undertaken were a body cast to be used.

The shock of the immediate operation is not great. The chief danger lies in the protracted convalescence in a rigid body cast.

25 E. Washington Street.

INTERMITTENT GASTRIC OBSTRUCTION FOLLOWING CHOLECYSTECTOMY

CLIFFORD U. COLLINS, M. D.
PEORIA, ILLINOIS

It is well known that a fixation of the pyloric portion of the stomach interferes with its motility and function. This disturbance to the function of the stomach may be caused by adhesions or peritoneal processes. I believe that fixation of the pyloric portion of the stomach may make possible an intermittent torsion which will cause attacks of pain and vomiting. It is difficult to prove that a twist or torsion of the stomach is present during the attack; however, it is probable.

Dr. Karl Meyer of Chicago, in a paper presented to the Western Surgical Association in 1930, on "Intermittent Gastric Illeus due to Mechanical Causes," did not mention adhesions of the pyloric portion of the stomach as a possible cause, but did say that a case of volvulus of the stomach had been omitted from his paper because of lack of demonstrable evidence.

Following a cholecystectomy, a patient may suffer from attacks of severe pain, accompanied with vomiting, in the right upper abdomen; the incision may reveal dense adhesions of the pyloric portion of the stomach which are separated and are prevented from reformation. It is a reasonable conclusion, therefore, that if the patient is relieved from the attacks of pain, then the adhesions were the cause of these attacks.

There is usually no fever and no appreciable increase in the white blood cell count in attacks of pain and vomiting due to mechanical causes. Recognition of these facts aids in the diagnosis.

Two illustrative cases of intermittent attacks of pain in the upper abdomen, with vomiting, following a cholecystectomy will be presented:

Case 1. Mrs. J. R. B. had a cholecystectomy performed on October 28, 1928. The sides of the gallbladder fissure fell together which covered the raw surfaces and it was not deemed necessary to suture the edges. No drain was inserted. She did well, however, for three months when she began to have mild attacks of pain in the upper abdomen a little to the right of the median line. The pain lasted several hours and required morphine, although morphine made her nauseated and she did not like to take it. At one time she went eight weeks without an attack. She felt well between the attacks of pain.

The attacks of pain became more frequent and severe and were accompanied by vomiting. The patient did not have any fever during the attacks and her highest white blood count was 10,200. We concluded that the trouble was mechanical and was probably due to adhesions. An exploratory incision was advised and accepted.

The incision was made on February 3, 1930, and revealed dense adhesions of the stomach to the under surface of the former incision. The duodenum was densely adhered to the fissure in the liver. As the adhesions were being separated, it was seen that as the stomach was rotated from above downwards, it produced a kink or fold in the duodenum.

After the adhesions were separated the omentum was brought up and the right corner was sutured to the region of the stump of the cystic duct. This put the omentum between the raw surfaces of the duodenum and the fissure in the liver, and also between the stomach and the under surface of the former incision. The omentum prevented the adhesions from reforming in their former position. In the event that adhesions did reform, the fatty omentum prevented them from becoming tight and dense. Her recovery was uneventful and there have been no more attacks of the pain.

Case 2. Miss M. K. had her gallbladder removed in June, 1933. In the fall of that year she began to have vomiting spells with pain in the right upper abdomen. She was seen by us on July 23, 1934. The attacks of pain and vomiting had increased in severity. One and one-half years before she had weighed 235 pounds and at the time of our examination she weighed 142½ pounds. The attacks of pain lasted several hours and were relieved by morphine.

She said that she had no fever during the attacks and her white blood count at the time of the examination was 10,150. She was tender on pressure over the midline of the upper abdomen, about one inch above the umbilicus. A diagnosis was made of adhesions of the pyloric end of the stomach to the liver and an exploratory incision was advised and accepted.

The incision was made on August 3, 1934. The pyloric end of the stomach was tightly adhered to the upper end of the gallbladder fissure. The dense adhesion was about the size of a half-dollar. The pyloric side of the adhesion was on the lower side of the pylorus. This twisted the pyloric end of the stomach

Read before the Section on Surgery, Eighty-fifth Annual Meeting, Rockford, May 22, 1935.

so it was reasonable to suppose that this condition caused the attacks of pain and vomiting. The adhesion was separated and the omentum was brought up and sutured as near to the stump of the cystic duct as we could estimate its location. This interposed the omentum between the stomach, duodenum and liver. The illustrations show the location of the dense adhesion with the method used to prevent the reforming of the adhesion.

The patient was last seen on November 30, 1934.

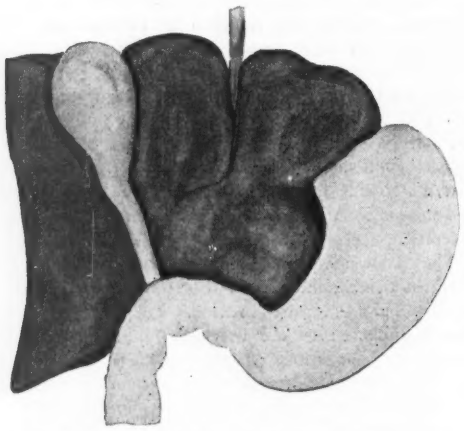


Fig. 1. The normal relation of the pylorus, duodenum and gallbladder when the edge of the liver is held up.

She had gained 16½ pounds in weight and was satisfied with the results of her operation.

Another case will be described which does not properly come under the title of this paper; however, it illustrates the principles involved in the condition and the method of preventing it.

Case 3. V. L. H., a baby three weeks old, developed symptoms of congenital stenosis of the pylorus. An x-ray examination revealed that none of the barium meal passed out of the stomach.

On January 28, 1929, a Rammstedt operation was done for the pyloric stenosis. The omentum was so thin in the emaciated baby that I did not think it would do any particular good to suture it over the operative area on the pyloric end of the stomach. The baby with its mother left the hospital. The baby was taking and retaining nourishment and was seemingly recovered. Two weeks after the operation the baby began to have an emesis of food with a gradual loss of weight. An x-ray examination again revealed that none of the barium meal passed out of the stomach. A diagnosis was made of an adhesion of the pylorus to the liver producing a kink in the duodenum, thus obstructing the passage of food.

A second operation was performed on February 24, 1929. The pyloric end of the stomach and duodenum were firmly fastened to the under surface of the liver, which produced a kink in the duodenum and caused obstruction. The adhesions were separated and the area on the pylorus and duodenum that had adhered to the liver was covered with the omentum. The little patient recovered rapidly and is now a healthy little girl.

During the last few years I have rarely sutured the edges of the fissure in the liver, following a cholecystectomy, but have interposed the omentum between the pylorus, duodenum and the fissure. No trouble has occurred when this was done. I cannot remember where the idea was obtained but I am not claiming any originality for the method.

If for any reason the omentum cannot be used in this way, the right portion of the transverse colon may be interposed between the fissure of the liver and the pyloric end of the stomach. Dr. E. Wyllys Andrews of Chicago, in a paper published in the *Journal A. M. A.* for September 16, 1905, advised the interposing of the colon between a gallbladder that had been drained and the stomach. His paper was entitled, "Colohepatopexy or Colon Substitution. A New Operation for Perigastric Adhesions after Gallstone Operations." Of course this was before the operation of cholecystectomy had superseded cholecystostomy. It is well known that

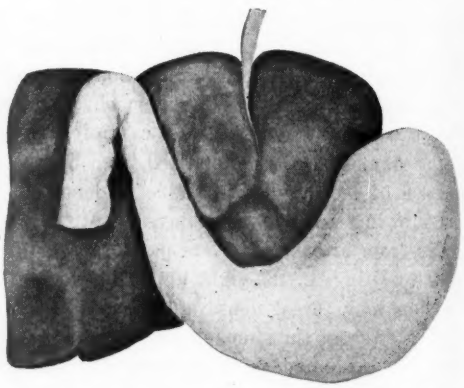


Fig. 2. The adhesion of the pylorus to the liver as described in Case 2.

adhesions of the colon rarely produce obstruction while adhesions of the small bowel frequently cause obstruction.

Conclusions. 1. If a patient has attacks of pain and vomiting without fever, or an increase in the white blood count following a cholecystectomy, the condition of adhesions of the py-

loric portion of the stomach to the fissure in the liver should be considered.

2. The placing of the omentum between the pyloric portion of the stomach, duodenum and the fissure should prevent any harmful adhesions.

DISCUSSION

Dr. John A. Wolfer, Chicago: The application of the principles that Dr. Collins brings up applies to other regions of the abdominal cavity as well as the vicinity of the gallbladder. We see such symptoms appear in two forms: more or less soon after the operative procedure and late. In the first instances they are due to acute gastric dilatation which may be due to or be associated with duodenal obstruction. The late to adhesions.

Adhesions have been a matter of concern of the surgeon since abdominal surgery has become developed. Their prevention and correction when once formed has taxed the surgeon's skill and patience. Periduodenitis as described by Shoemaker and called Shoemaker's disease is a very trying condition. At times the duodenum is enmeshed by dense adhesions or there may be distinct bands which extend from the region of the hepatic colon to be attached to the under surface of the right lobe of the liver, constricting the duodenum. In some of the these instances the severance of a band may relieve the obstruction. Since adhesions are commonly encountered one might speculate as to

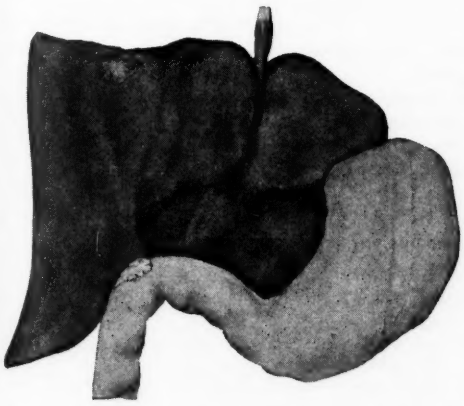


Fig. 3. The adhesions of the pylorus and liver described in Case 2 separated and the pylorus placed in its normal relationship to the liver.

how they may be prevented. In a course of lectures to students on postoperative complications, I have stressed this point. There are certain things we may do during the operation which predispose to the formation of adhesions. The most important is trauma. Trauma along with drying of the serous coat of exposed organs in the absence of infection, in my opinion, is the cause of the largest percentage of postoperative adhesions. When a loop of gut is allowed to become dry and then traction made against it with the hand or gauze pad, the superficial layers of the serosa are wiped or torn away, thus favoring the agglutination of its surface against another and equally traumatized surface.

Dr. Collins mentioned that in his first case after the removal of the gallbladder the edges of the liver fell together and yet adhesions occurred. We all recognize that one individual will develop adhesions when an-

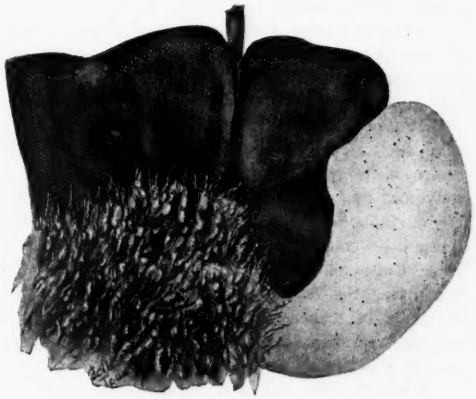


Fig. 4. The omentum placed between the fissure in the liver and pylorus and duodenum to keep the adhesions from reforming.

other will not; also that one individual will develop adhesions that will tend to disappear or become pliable while in another, they tend to become denser and contract so as to compress those organs or structures within their grasp.

The technique described by Dr. Collins reminds me of a case under my observation some years ago. This patient had been operated upon on two occasions elsewhere and presented symptoms as described by Dr. Collins. At the operation there were found many adhesions between the liver, duodenum and stomach and colon. It appeared as though some type of plastic procedure had been tried. The adhesions were freed and a free omental transplant inserted between the lower surface of the liver and duodenum. She returned a year or more later with recurrence of symptoms and by rentgenological study a marked duodenal stasis was observed. She was operated upon again and because of extensive adhesion with obstruction low in the duodenum a duodenojejunostomy was performed. She has had relief since this last procedure.

I think the presentation of this subject by Dr. Collins is very timely because not infrequently after upper abdominal operations such a group of symptoms occur. If the symptomology is as he has outlined, something radical must be done. There are other types which are not so urgent or distressing, but there is a symptom residue and the patient is not cured. It is often a problem as to whether they can be benefited by some surgical procedure. I think Dr. Collins' plan

of inserting the omentum betwen the liver and the duodenum is a very good one and deserving of trial.

Dr. George deTarnowsky, Chicago: Dr. Collins' paper is very timely. We need these practical points which we can carry home and use in our practice. We have also seen these postoperative cases. Most of them, as Dr. Wolfer says, are not sufficiently invalided to require a second operation. They complain of bloating, nausea and distention following a heavy meal. They hardly ever get to the point where they have loss of weight or are actually run down. I have noticed that the individuals who complain most of these postoperative symptoms are those in whom the healed incision is almost a keloid. They seem to have a predisposition to the outpouring of connective tissue. I think it is that type that Dr. Collins has so well described. I have such a patient under treatment now. I did a cholecystectomy on him three years ago. He is now convinced that he has a carcinoma of the stomach. So far our laboratory tests are negative. I am certain if he does consent to a second operation I will find these dense adhesions. I think Dr. Collins' plan of transfixing the omentum is an excellent one. Where it cannot be transfixed, a free omental flap is a very excellent substitute. There is enough agglutination to hold the omentum in place.

As Dr. Wolfer has said, the essential thing is the absence of trauma at the time of operation. Gentleness in handling tissues, avoidance of undue traction on the stomach and duodenum in the performance of cholecystectomy or whatever type of operation we are performing, are most important points.

PRIMARY URETHRAL CALCULI

Report of a case with resection of the urethra.

NORRIS J. HECKEL, M. D.
ROBERT E. JOHANNESEN, M. D.
CHICAGO

While the medical literature of today abounds with innumerable discussions of calculi found in the genitourinary system, few have been the discussions of the occurrence of such calculi in the urethra. Still more infrequently, has the discussion been addressed to the subject of primary urethral calculi; therefore, we present the following case history, which we believe will prove to be of unusual interest.

Case report: Mr. S. P., aged 63 years, married, entered the Presbyterian Hospital on December 31, 1934, with acute urinary symptoms of frequency, urgency, nocturia, dysuria, pyuria and hematuria, all of four days' duration.

Onset and course: For the past six weeks, the patient has had a severe asthma, characterized by dyspnea, shortness of breath and a severe cough. These symptoms could only partly be controlled by medicine. Four days ago, he noticed that each specimen of urine was red, and this was followed by marked dysuria and burning. Simultaneously with the onset of the hematuria, frequency of micturition developed and has increased gradually until he now voids every thirty to forty minutes. There is no force to the stream and the hesitation and dribbling has increased in severity during the last twelve months. Thirty years ago, he had to be catheterized five or six times because of an acute retention. This was not preceded by any attack of pain similar to a renal colic, and he was told by the physician that a stricture was the cause of the trouble. From then until the onset of the present symptoms, he has been very well, except that during the last one or two years the urinary stream has been getting smaller and its force gradually diminishing. No stones have ever been passed, nor has he had any previous attacks of renal colic. Venereal disease, he denies.

The past history, family history, and history by symptoms are essentially negative.

Physical examination: The patient is an elderly white male, well developed but emaciated. He appears acutely ill.

Head and neck: The tongue is dry and coated. *Eyes:* Pupils react to light and accommodation. *Neck:* Negative.

Cardio-respiratory: The heart reveals no important pathological alterations. The chest is full of coarse, wheezy, rattling sounds; there are no areas of dullness.

Abdomen: In the upper right quadrant, to the right and above the umbilicus, is a questionable palpable mass, which might be kidney or liver. There is no fluid nor areas of tenderness.

Nervous system: Deep and superficial reflexes present. No pathological reflexes; no sensory disturbances.

Genitalia: The external genitalia is negative. On palpation of the perineum, a firm, hard, circumscribed mass about the size of a large olive can be felt just back of the scrotum.

Rectal: The prostate is slightly enlarged, smooth, and elastic. The seminal vesicles are palpable.. The findings are not suggestive of carcinoma.

Laboratory findings:

Blood Count:

Hemoglobin	65%
Red blood count	5,230,000
White blood count	9,400
Differential count	N-56 (100 counted)
	SM-30
	T-4
	E-10

Blood pressure = 120/70.

Urine:

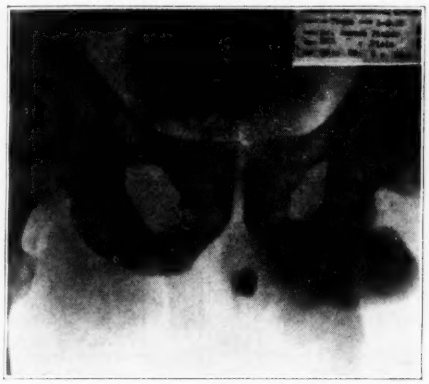
Sugar	0
Albumin	2 mm.
Calcium phosphate casts	+
Triple phosphate casts	+
Red blood cells	0
White blood cells	0
S. G.	1.020
Debris	+

Urine cultures: B-coli.

Roentgen ray findings: Chest: The film shows rather heavy hilum shadows, and moderately heavy uniform

intensification of lung markings in both lung fields, suggestive of chronic bronchitis.

Genito-urinary system: The kidney outlines are normal. No evidence of urinary stone shadows are seen. On the smaller film, there is a dense oval shadow, measuring about 12 x 18 mm. and lying in the soft tissues 2 cm. below the lower border of the symphysis pubis which raises the question of a stone within the urethral canal. There is a small density near the outer part of the right transverse processes of the third and



1. Plain X-ray of stone; note position.

fourth lumbars, which suggests a calcification in a gland rather than a urinary stone.

Excretory pyelograms: Both kidney pelves are at the level of the second lumbar, small, normal. Lower part of both ureters are irregular dilated and atonic. The bladder is not well visualized. The small density in the right side of the abdomen is outside the line of the ureter. The dense oval shadow below the symphysis is still present and well visualized on a small film. It strongly suggests a stone in the lower urethra.

Urethrogram: A very small amount of the opaque solution has passed the previously described shadow and has filled the urethra above for a distance of about one inch. There is no dilatation of this portion of the urethra.

Cystoscopy: An attempt was made to pass a No. 20 cystoscope into the bladder, but it met an obstruction at the bulb. Several efforts were made to pass bougies, filiforms and sounds through this obstruction but with no success.

Operation (N. J. H.): On January 5, under general anesthesia, a typical perineal prostatectomy inverted "U" shaped incision was made. The superficial and deep fascias of the perineum were dissected upward, after which the bulb and transverse perinei muscles came readily into view. The stone could be palpated through the bulb. An incision was made through the midline of the bulb, and a large, smooth stone the size of an olive was removed. It was imbedded in the urethra and surrounded by much hard, fibrous tissue.

The urethra, at each end of the pocket where the stone rested, was almost completely stenosed. Various types of sounds could not be passed through this region. Therefore, one inch of this part of the urethra was completely resected, and reconstruction of the urethra by an end to end anastomosis was made around a No. 20 soft rubber catheter. which was placed into the bladder through the penis. The usual closure of the wound was made and the patient left the operating room in good condition..

Subsequent course: The patient made an uneventful recovery. On the eighth postoperative day, the indwelling catheter was removed, and the patient discharged four days later. Since then, on an average of once a week, sounds up to No. 29 have been passed without difficulty. The urinary symptoms have entirely disappeared.

Chemistry of the stone: The surface of the stone was smooth and shiny. When cut in half it was homologous with no evidence of circumscribed nucleus The chemical composition was principally phosphate with a slight trace of calcium oxalate.

Before proceeding with the discussion of urethral calculi, we observe that J. Swift Joly has classified these unusual stones into two separate divisions: migratory, or secondary, and autochthonous, or primary.

It is obvious, that the reported case is em-

2. Urethrogram, showing absence of dilatation proximal to the stone.

braced in the latter classification. These particular stones are always formed in the urethra itself, or in a pouch opening from it. They are uniform in structure, composed of phosphates, and generally infected.

The origin of the migratory stones is in the bladder or kidney, the stone later migrating to

the urethra. These stones have a distinct nucleus and are composed of uric acid or calcium oxalate.

In a series of 34 urethral stones admitted to St. Peter's Hospital from 1915 to 1924, Joly found only three which belonged in the autochthonous group.

Debenham, who studied 40 cases of urethral stones from the London Hospital in the last twenty years also found only three that could be considered as primary. From a series of 405 urethral calculi, Englisch reports 35 autochthonous stones, or a proportion of about 1:11.

In regard to the position of stones in the urethra which was also studied by this author in 361 cases, the following results were given:

Posterior urethra	41.2%
Bulb	18.8%
Scrotal	13.8%
Penile	14.6%
Fossa navicularis	11.3%

Jeck in a study of 17 cases of stones and other foreign bodies in the urethra found that in the stone cases, of which there were fourteen, half were in the posterior urethra and half in the anterior. Five of the stone cases had stones elsewhere in the urinary tract.

In the Debenham series, 50 per cent. of the 34 secondary urethral stones were impacted a short distance behind the external urinary meatus; he also observed that 21 per cent. of his cases had previous stone histories, five patients being readmitted because of recurrent impacted urethral calculi. Although urethral stones are considered to be a disease of middle aged and elderly persons, stones do occur in children. This same investigator gives the ages of the patients as follows:

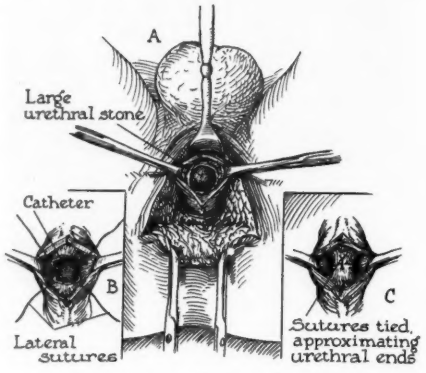
Years	
0- 5	6
6-10	4
11-20	1
21-30	9
31-40	6
41-50	5
51-60	2
71-80	1

Joly submits a comparative table of urethral and vesical calculi in the various age groups:

Age	Urethral	Vesical	Proportion
1-19	3	10	1- 3
20-39	6	43	1- 7
40-59	16	138	1- 8
60-79	9	176	1-19

In patients admitted to the Canton hospital, Thompson found the proportion of urethral to vesical calculi to be 409 to 2,962; 43 per cent. were under 20 years of age, and 41 percent. were between 20 and 50.

Many other authors including Hess, Pasley, Hall and Parnell, Mullerschoen, Macewen, Lai, Balch, and Irvine have reported interesting cases. Pasley reports a case having 120 phosphatic calculi removed from the urethra, and Wheeler's case, a Chinese boy of 9, had 93, the largest of which was 1½ inches by 1⅛ inches. Lai had a patient, a Chinese boatman, from whom a total of 2,170 stones, weighing 81 gms. were removed.



3. Drawing, technique of operation.

Etiology: Secondary, or migratory stones of the urethra are formed in the kidney, bladder, or prostate, and are about ten times as frequent as autochthonous.

The primary formation of stones in the urethra is influenced to a great extent by stagnation and infection that usually develop from poorly drained cavities. These pouches are most commonly formed by prostatic or peri-urethral abscesses; infected glands during an acute Neisserian infection; congenital or acquired diverticula; and from ulcers or tears of the urethral mucous membrane which later become encrusted with phosphates. Foreign bodies lodged in the urethra can also be a nucleus for the formation of these primary stones. Stricture of the urethra, unless accompanied by an associated pathological finding, is not a common etiological factor in the development of primary stones. The frequency of urethral stricture and the rarity of autochthonous calculi would speak against this factor as playing an important role in the etiology of this group of calculi.

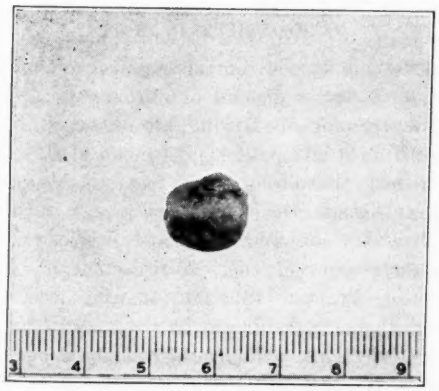
The majority of urethral stones are single. However, if developed in a pocket or diverticulum

they are more likely to be several, and sometimes may be present in large numbers. Although most of the stones are small, many times, especially when found in a cavity, may be unusually large.

Pathology and associated pathology: Inflammatory changes are always present, and from long continued irritation fibrosis of the adjacent tissues occurs with the development of strictures. Areas of leucoplakia have been noticed which would indicate that the stone might be associated with a malignant disease. The formation of an abscess which later can rupture externally with the stone being passed has occurred.

The associated changes in the upper urinary system depend upon the amount of obstruction produced by the stone. These changes may be extensive, such as chronic retention with cystitis, dilatation of the ureters and an ascending pyelonephritis. In cases of a sudden, completely impacted urethral stone, the clinical pathology is that of an acute retention. Although the occurrence of a dilated urethra proximal to the stone has been observed many times, however, such is not always the case, and the urethra may maintain its normal anatomy. Such was the finding in our case.

Symptoms: The symptoms of urethral calculi vary markedly. Many times, because of the



4. Photograph of stone, ½ actual size.

symptomless hematuria, tumors of the bladder and kidney must be considered in the differential diagnosis. In general, it can be said that primary, or autochthonous stones are dormant for a long time without producing any distress. If they have developed in a cavity, the urinary symptoms are very few, or entirely lacking, until a swelling or sore spot attracts the patient's notice to this region.

On the other hand, the symptoms of the secondary, or migratory stones are usually quite severe. If the impaction is sudden and complete, the symptoms are acute in onset and present the picture of an acute retention, characterized by a sudden stoppage of the stream, marked tenesmus, strangury, and later extreme exhaustion. Quite a different picture is observed if the impaction is only partial. Usually in such cases, careful inquiry will frequently uncover a history of previous attacks of renal colic, or passage of stones. In this group of cases, the complaints are generally insidious in onset, the most characteristic of which are dribbling, hesitation, sudden stoppage of the stream and then with manipulation the ability to void again, hesitation and lack of force which may later develop into an incontinence with retention. Urethral discharge, dysuria, and pyuria are not infrequent complaints. Pain is usually present and may be located in the penis or perineum, or referred to the suprapubic or lumbar regions.

In all types of urethral stones, hematuria, either gross, or microscopic, is a very common finding. The variability of the symptoms depends upon the site at which the stone is impacted, or located, in the urethra, and also upon the size and number of the stones.

The diagnosis is made on a careful, accurate history, and physical examination. Many times in palpation of the urethra and perineum, the stone can be felt. In cases where it is located in the posterior urethra, the stone may be felt upon rectal examination. The next simple procedure is the exploration of the urethra with sounds or bougies. Many times the grating of the instrument against the stone can be felt. Urethroscopic examination is useful and helpful in not only establishing the correct diagnosis, but also to detect the presence of complications or associated pathology. Radiography, including urethrograms, is invaluable in localizing the stone. Calculi in the posterior urethra often present greater difficulties from the viewpoint of the x-ray interpretation for the reason that they may be confused with true prostatic or vesical calculi.

The treatment of urethral stones is exceptionally variable, and depends entirely upon the size, location, and associated pathology of the

calculus. If the stone is lodged in a cavity or diverticulum, or extensive strictures are present, then it is necessary, of course, after the removal of the stone from whatever procedure, to correct these associated conditions. According to several writers, urethral calculi have a distinct tendency to recur. Perhaps one of the principal reasons for these frequent recurrences is due to the failure to recognize, or to properly correct the associated pathology at the time of the original operation.

In the treatment of stones situated in the anterior urethra, it is frequently only necessary to do a simple meatotomy, and then remove the calculus with an ordinary pair of forceps. The procedures become more complicated, however, if the posterior urethra is the site of the calculus, or if they are imbedded in a diverticulum or pouch. In such cases, several methods can be followed. First, an external urethrotomy; second, if the stone can be pushed back into the bladder a lithotrite can then be used to crush the stone. There are some authors who believe that the best treatment, especially for large stones, completely enclosed in the posterior urethra, is a suprapubic cystotomy.

Debenham in his treatment of 34 cases reported the following methods:

Calculus passed naturally	4
Removed with forceps per urethra	20
Pushed back into bladder and crushed	4
External urethrotomy	5
Suprapubic aspiration of urine	1

Jeck's procedure in his cases was:

External urethrotomy, perineal, in half of which an internal urethrotomy was also done	6
External urethrotomy in penile portion of urethra directly over stone	4
Suprapubic cystotomy	1
Meatotomy	2
Dilatation of urethra	1
Forceps	1

The stones varied from the size of a small pea to a large olive. He had two post-operative deaths.

The mortality from the removal of urethral stones depends upon the length of time the stone has been present and the degree of infection. Usually the larger the calculus, the more dangerous the risk.

The postoperative care should include, because of the frequency with which the calculi recur, regular periods of observation for at least a year or two, and treatments if indicated, such as passage of sounds, and the elimination of urinary infections.

SUMMARY

1. A case of primary urethral calculus is reported.

2. The etiology, pathology, and symptoms of urethral stones are considered.

3. The treatment of urethral calculi is reviewed, and the author's method in their case presented.

REFERENCES

1. Balch, James F.: American Jour. Surg., 26: 39-393, 1934.
2. Debenham, R. K.: Brit. Jour. Urol., 2: 113-121, 1930.
3. Englisch, J.: Archiv. f. klin. Chir., 72: 487-1904.
4. Englisch, J.: Deutsche Zeitschr. f. Chir., 79: 127-215, 1905.
5. Hess, Elmer: Brit. Jour. Urol., 2: 44-46, 1930.
6. Hull, H. R. B. and Parnell, R. J. G.: Lancet, 2: 1023, 1928.
7. Irvine, E. D., Brit. Jour. Urol., 4: 156-158, 1932.
8. Joly, J. Swift: "Stones and calculous disease of the urinary organs," C. V. Mosby Company, St. Louis, 1929.
9. Jeck, Howard S.: Amer. Jour. Surg., 9: 335-337, 1930.
10. Lai: China Med. Jour., 42: 297, 1928.
11. Macewen, J.: Brit. Med. Jour., 1: 154, 1929.
12. Mullerschoen, George J.: Jour. Urol., 22: 54, 1929.
13. Pasley, C. B.: Brit. Med. Jour., 1: 443, 1928.
14. Thompson, J. W.: Brit. Med. Jour., 2: 381-382, 1933.
15. Wheeler, E. R.: Brit. Med. Jour., 1: 443, 1928.

55 E. Washington Street.

122 S. Michigan Blvd.

HERPES ZOSTER

FRANK GARM NORBURY, A.M., M. D.
Associate Physician, The Norbury Sanatorium,
JACKSONVILLE, ILLINOIS

Infections of the central nervous system are of interest to the general practitioner as well as to the neurologist. My interest follows through from clinical and pathological material in poliomyelitis in Boston in 1916, from cerebrospinal meningitis studied in military service both in this country and in France, and from a few of the early cases of encephalitis lethargica seen while in France. Special attention has been given at the Sanatorium to these three major acute infections, poliomyelitis, cerebrospinal fever and to epidemic encephalitis, the last in both its older and newer forms. Syphilis of the central nervous system is another infection of far-reaching clinical, social and economic importance.

There is one condition generally accepted as an infection, perhaps classified as minor, but which may give symptoms referable to major distress. Herpes zoster or in lay usage "shingles"

Paper read before Section in Medicine, Illinois State Medical Society, Rockford, Illinois, May 22, 1935.

is seen in the practice of every physician. Fox[1] states "Herpes zoster is named from its frequent location on the trunk which suggests a girdle. *Zoster* (Greek) and *zona* (Latin) signify a girdle as does the word *cingulum,* from which the common term 'shingles' is derived." It may occur over any nerve segment of the body that has skin distribution. The more severe symptoms and complications are more frequently seen with herpes of the cranial nerves, particularly the trigeminal.

It is, as stated above, generally accepted as an infection. Traumatic and toxic origins have been suggested but evidence points more towards infection "caused by an unknown filterable virus."[2] Joslin[3] describes a case of diabetes in which during an attack of herpes zoster the carbohydrate tolerance fell markedly. He says "This is interesting because it suggests the infectious etiology of the disease." We have seen one case of a similar nature where twice as much insulin was required during an attack to keep the patient sugar free. Rivers, in a discussion of filterable viruses and the nervous system states: "In spite of the fact that there is only suggestive evidence of the existence of a zoster virus and regardless of the conditions under which herpes zoster occurs the character of the lesions observed in the skin has induced a number of workers familiar with virus diseases to entertain the idea that it is caused by some kind of a virus."[4]

The pathology is an acute inflammatory reaction mostly in the posterior root ganglia or their equivalents, the Gasserian or geniculate ganglia. Head and Campbell[5] studied twenty-one autopsies and found hemorrhagic lesions in the ganglia in the most acute cases and some changes in them in all, sclerosis in older ones. Lesions have been found in the posterior gray columns of the cord. Muscular weakness and occasional atrophy indicate further extension has occurred. The pathological appearance both gross and microscopic resembles that of poliomyelitis, save for the difference in the part of the central nervous system involved. Therefore, the disease has been called by some posterior poliomyelitis. The histopathology is that of congestion of vessels, perivascular hemorrhage and lymphocytic infiltration. This infiltration also appears in the tissue of the ganglion. Degeneration of dorsal roots and peripheral nerves has been found.

Pathologic study of the skin lesions shows the vesicles to be deeply seated, usually unilocular and involving the lower rete and even the papillary layer. The cavities are filled with serum, leucocytes and broken down epithelial cells. Acidophilic staining of epithelial cells at the sides and base of the lesion add to the histologic picture.

The onset of the disease may occur apparently spontaneously, reacting like an acute infection in an otherwise healthy individual. Particularly is this the case in children and younger adults. It may appear in persons whose general health is below par by reason of other disorder. One patient who had had a breast removed for carcinoma stated she had more pain in a herpes attack than she had had during her entire hospitalization for her operation. We have seen it appear in one case following vaccination against smallpox and have known it to follow injection of typhoid—paratyphoid vaccine. The association of herpes zoster and varicella has been studied both clinically and experimentally by many observers. We have observed it in two cases of central nervous system syphilis following neoarsphenamine in one, tryparsamide therapy in the other. Arsenic has been mentioned as a causative toxic agent. Rivers (loc. cit.) says "The fact that viruses tend to localize in irritated tissues may also account for the relation that has been observed to exist between certain cases of herpes zoster and nerve injury due to chemical, physical or disease-producing agents."

The portion of the body most frequently affected is as the name implies the trunk. The segments of the cord from the second thoracic to the third lumbar are said to be the most frequently involved. The word "shingles" connotes to most of us a typical involvement on the trunk. There are often some general constitutional symptoms with fever, malaise and a moderate amount of prostration preceding the localizing skin eruption. Itching sensation or pain of neuralgic character usually precedes the appearance of the vesicles. They have a tendency to come out in crops. The first lot are apt to appear where the posterior primary, lateral branch of the anterior primary and the anterior branch of the anterior primary division of the sensory portion of the nerve trunk reach the surface. These correspond roughly to the paravertebral, posterior axillary and anterior axillary lines on the trunk

of the body. Eventually the whole area supplied by the nerve trunk or trunks may be filled in with the eruption.

Once a well defined collection of vesicles following a nerve trunk is observed the diagnosis is easy. The patient will present himself under such circumstances with the statement "I've got shingles. What am I going to do about it?" or "Can't you do something to stop this pain?"

There are some instances though where the diagnosis is not so easy. A case in point is that of a man 66 years old who has been under observation at intervals by one or another member of the Sanatorium staff for several years for a mild recurrent anxiety state. This was usually accompanied by gastrointestinal upsets associated with immoderate habits of eating. Last fall he appeared with the complaint of severe pain which started under the rib cage on the left and radiated towards the navel. He had had negative x-ray examinations and gastric analyses in the past. Yet there was at first some concern as to whether some serious intra-abdominal condition had been developing in the time since he had last been seen. The type and character of the pain and its distribution and the presence of two small vesicles in the left paravertebral area over the tenth dorsal distribution led to a diagnostic prediction of zoster. This diagnosis was received with considerable skepticism on the part of the patient and his wife but was confirmed by the subsequent progress of the situation. It has occasionally been possible by the neuralgic type and segmental distribution of the pain to predict the diagnosis but more often of course the cases are seen when well under way. However, these two characteristics have been extremely helpful in our experience. They have been of value not only for the diagnosis of the condition itself but in differentiating it from other possible conditions. An instance of this was in a case seen in consultation where the diagnosis of an acute appendicitis or a renal colic was in doubt in a young adult with a gastrointestinal history. There were the constitutional symptoms of nausea, fever and malaise, the history of previous digestive disorder. There was tenderness in the right lower quadrant but the radiation of the pain was around from the back. The nerves supplying the skin area in the lower quadrant are from the 11th and 12th dorsal segments. When the patient was turned on her back a little crop of vesicles was observed, the diagnosis of zoster was made and confirmed. Now with the relative infrequency of zoster as compared to acute appendicitis in young people this is not of great significance but in this particular instance it did count for something.

Pleurisy, intercostal neuralgia and angina pectoris are conditions to be differentiated in herpetic involvement of the segments of the upper dorsal cord in so far as the pain is concerned. Aside from the more generally accepted symptoms and signs of pleurisy and angina emphasis would again be placed on a reiteration of the description of neuralgic type and segmental distribution of pain of herpes zoster. As for intercostal neuralgia many disorders are ascribed to that heading. It is more often the patient's than the doctor's diagnosis in our experience. Histories of some of these cases have led us to believe that we are dealing with persistent neuralgia pain after an acute attack of herpes zoster in which the eruption was slight and not considered a part of the disorder.

The skin lesions themselves may at times present some consideration for diagnosis. Herpes zoster is given considerable space as a skin disease in the text-books of dermatology. Fox (loc. cit.) says "it is a fairly common disease comprising about one-half per cent. of all skin diseases seen in the United States." That the local lesions are not of trophic origin but are a part of the disease process is brought out by Rivers in the discussion of his paper where he states "The lesions in the spinal cord and in the skin are caused by the same agent, a virus." This fact has not been generally recognized.

Differentiation from other skin conditions is easy on the trunk. If there is difficulty it is more apt to be when the face, scalp or ears are involved. We have seen herpes zoster of the ear and of the scalp called erysipelas and of the ophthalmic and mandibular divisions of the trigmenial called localized skin infections.

As stated previously the most common location is the trunk. Our list of cases includes, however, almost every area of sensory distribution over the body. The ophthalmic distribution of the trigeminal is always a serious place for zoster on account of two possibilities, first corneal herpes with resultant scarring and visual impairment, second severity of pain and toxic mental reaction. We have seen two cases with toxic psychoses

directly resulting from this. Herpes zoster involving the geniculate ganglion of the seventh nerve aids in the study of the sensory distribution of this nerve. It supplies the skin on the back of the auricle. When there is unilateral involvement with typical lesions appearing on the skin of the external ear on one side and when there is pain the diagnosis of herpes zoster involving the vagus nerve is justified. One case of this type showed dysphagia and bradycardia as well. Bilateral herpes of the ear is usually herpes simplex and is not associated with pain. Affection of the sensory portion of the great occipital nerve has been seen twice.

The extremities are infrequently involved but cases including branches of the brachial, lumbar and sacral plexuses have been seen. One cast of interest in a woman with mediastinal tumor involved the lower sacral nerves supplying the bladder. Although there was marked vesical pain and desire to void the patient had to be catheterized. The question of metastasis of the tumor to the sacrum with nerve root involvement naturally came to mind. Eventual opportunity for post mortem failed to show metastases in that region.

The skin lesions dry up in from a few days to two weeks. Scarring depends on the depth of the vesicles and whether or not there has been secondary infection. Neuralgic pain persisting after the skin condition has entirely disappeared is the most frequent residual. This is especially true in older people who have some underlying chronic disease. The pain may last for months.

The management of herpes zoster is symptomatic as described in most text-books. Perhaps the measures here mentioned are likewise symptomatic. However, they have seemed to be of more benefit than measures previously used. Ruggles in 1931 wrote of the use of sodium iodide intravenously in herpes zoster.[6] He reported its use in 15 cases with favorable results. We have employed it in practically every acute case seen since that report came to our attention. Where we have not used it for what appeared sufficient reasons we have often wished we had.

Our custom is to give one gram in ten per cent. solution intravenously the first day, then two grams each day for four or five days. The results have been quite satisfactory though no control of alternate cases has been carried out. We have the impression but would not want to state it more positively than as an impression that the vesicles have dried up more promptly and the pain has been lesesned in the cases where sodium iodide has been used. It has also been used, though with less apparent benefit in late cases.

Pituitrin has been reported by many to be of value in prompt relief of pain. Some reaction occurred in two cases where it was used. The results with the iodide were so satisfactory in acute cases that pituitrin has not been further employed.

As local measures many agents have been recommended. For the last few years we have employed zinc oxide ointment or paraffin sprayed on the vesicles. The use of paraffin gauze does away with sticking of dressings where protection from clothing has been necessary. Small pieces or strips of this have worked very well.

Simple analgesics such as sodium salicylate or amidopyrin are prescribed at first, later are usually not necessary. Codein has occasionally been employed where pain has been severe.

Most cases are ambulatory when seen. Those with cranial nerve involvement, particularly the ophthalmic portion of the trigeminal, should lay up till the acute stage has subsided. Those with an underlying disorder should of course receive treatment for their primary condition as well as their herpes zoster. They may already be bedfast. If not, the appearance of a herpes of average severity justifies this limitation of their activities.

Knowledge of virus diseases as a whole has increased greatly in recent years. As this knowledge extends we will learn more of these virus infections of the nervous system among which is classified herpes zoster.

REFERENCES

1. Fox, Howard: Skin Diseases, Clinical Pediatrics, 16: 87, D. Appleton and Co., New York, 1930.

2. Grinker, Roy R.: Neurology, p. 684, Charles C. Thomas, Springfield, Illinois, 1934.

3. Joslin, E. P.: Treatment of Diabetes Mellitus, 4th ed., p. 712, Lea and Febiger, Philadelphia, 1928.

4. Rivers, T. M.: Relation of Filterable Viruses to Diseases of the Nervous System, Infections of the Central Nervous System, A. A. R. N. M. D. publications, 12: 49, Williams and Wilkins Co., Baltimore, 1932.

5. Head, H., and Campbell, A. W.: The Pathology of Herpes Zoster and its Bearing on Sensory Localization, Brain, 23: 353, 1900.

6. Ruggles, E. W.: Apparent Specific Effects of Sodium Iodide; preliminary report, Arch. Dermat. and Syph., 23: 472, 1931.

DISCUSSION

Dr. Sidney D. Wilgus, Rockford: I consider it an honor to be asked to open this discussion. Dr. Nor-

bury has covered the subject itself so thoroughly that I think it is difficult for anyone to discuss the various aspects of the paper with any added profit.

However, there are certain points, more or less philosophical, which might be advanced as matters of generel interest bearing on the subject of diseases of the central nervous system. Herpes zoster is generally accepted as one of the infections of the central nervous system. As Dr. Norbury has said, the pathology is very similar to that of anterior poliomyelitis only this time it is located in the posterior ganglia and analogous situations throughout. Inasmuch as one is accepted as an infectious disease, it would seem perfectly logical that the other be taken as infectious as well. This brings up the point that there are areas in the central nervous system more easily infected by single forms of germ life than others. In other words, certain diseases are more or less selective in the point at which they finally show themselves. That is so with many diseases of the central nervous system. For instance, in the tuberculosis of childhood with meningitis, the base is selected; in anterior poliomyelitis it is the anterior motor cells; here it is the posterior ganglia. Various strains of spirochetes pick various portions of the central nervous system in which to do their damage; the virus of influenza selects the region of the red nuclei and the black nuclei and the aqueduct of Sylvius to work its damage. These facts are very interesting.

These troubles are suggestive of or show a tendency to biological local structural defects of the central nervous system. Although grossly speaking the basic structure of the central nervous system consists of cells and fibers, there are areas that seem to be more open to specific attacks than other areas. The selectivity may be due to the qualities of the viruses themselves or to biological differences in the different areas of the central nervous system or both. Now if viruses and toxins are capable of selecting their own foci, why can we not suspect that less intense but more prolonger toxic conditions may have a bearing on the development of various organic changes in the central nervous system such as those, for instance, that seem the basis of the decline of advancing age? A phantasy perhaps, but an interesting one.

The march of medicine is not over and at some not distant date the branches of chemistry, bacteriology and biology will solve this problem as it is solving other problems day by day. Curiosity in medicine is insatiable.

Question: I would like to ask if there are any cases of herpes zoster where there is no pain?

Question: I would like to ask about the relationship of age to pain?

Dr. F. G. Norbury, Jacksonville (closing): I am extremely grateful to Dr. Wilgus for his courtesy in coming here and for his approach to this subject.

The reasons for the origin of infections as well as other disorders of the nervous system I think are the things that arouse our curiosity and stimulate our interest, and give us something to think about in the matter of approach to such a problem. Our curiosity in the long run will be helpful to us and to our patients.

In regard to pain, I have not had occasion to see any cases without pain, nor do I recall of having read of any cases of true herpes zoster without pain. There are other herpetiform conditions that occur without pain and I do recall reading some place, as well as observing, the situation I spoke of where bilateral herpes of the ear occurred without pain, and the statement was made that if there was pain it was unilateral.

As to the relationship between age and pain, in our experience the pain is greatly increased the older the patient. Many young people break out with shingles and are not disturbed at all. It also appears that if there is some underlying disturbance, as in the incident I mentioned of carcinoma of the breast with herpes, the severity of the pain, because the patient's threshhold is lowered, is more apparent.

Just one thing else in conclusion, if there comes any question of diagnosis, I think the thing that has helped me most is that when there is neuralgic type of pain following segmental distribution, then think of herpes zoster.

THE REMOVAL OF SUPERFLUOUS HAIR BY MULTIPLE ELECTROLYSIS

WM. A. ROSENBERG, M. D.

CHICAGO

Superfluous hair is not an uncommon disorder in women. In proportion to the luxuriance, prominence and site of the growth, it is a blemish to feminine appearance and beauty, and thereby presents to women thus afflicted a serious problem and impediment in business, society and the home. The condition may produce pronounced psychological and emotional reactions such as a desire to remain in seclusion, mental depression or melancholia, and may be a handicap in securing gainful employment, social prominence or a desirable mate.

The medical profession has heretofore displayed a common disregard and lack of attention to this condition, with the result that women so affected often resort to so-called "beauty specialists" or accommodating druggists for treatments or relief. At their best such ministrations are unskilled and unsupported by proper training and knowledge. Unapt or improper electrolysis and harmful depilatories often cause unsightly scarring, eczematoid dermatitis, follicular infection, or transformation of downy hair into coarser hair.

One of the oldest methods of removing superfluous hair is by means of chemicals. Pastes of barium or calcium sulphide are commonly em-

ployed. The objection to their use is that they require frequent repetition and in time set up an eczema of the face or armpits, often followed by a crop of boils.

The removal of superfluous hair by roentgen therapy was suggested by Freund[1] of Vienna in 1897. This method became popular and was used extensively for a while. It was soon realized, however, that to be successful it was necessary to give exposures of x-ray which were injurious to the skin. Often many years after the treatment, telangiectasia and atrophy of the skin have resulted. Since improvement is very uncertain with safe roentgen exposures, the method has been entirely disregarded by the medical profession but is still being employed by advertising institutions.

The use of pumice stone has been found helpful by Schwenter-Trachsler.[2] He reported a series of cases in 1912 in which pumice stone was rubbed twice daily into the shaved skin. This

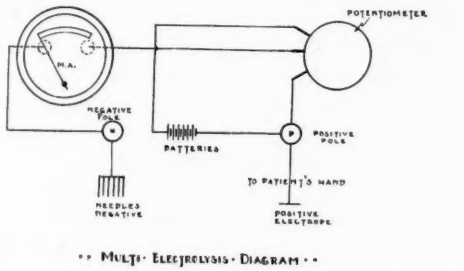


Fig. 1. Showing the flow of electric current from the batteries to the electrodes.

method may have to be continued for over a year. It is not a popular method and has not received much support.

Many favorable reports have been recorded with the use of diathermy in the removal of superfluous hair. H. Bordier[3] of Lyon, France, has been using this method since 1923 and states that electric high frequency has many advantages over other methods.

Single electrolysis for the removal of ingrowing eyelashes was introduced by Michel in 1875.[4] In his report he suggested its use in superfluous hair of the face. This method consists of introducing into the hair follicle a single needle attached to the negative pole of a galvanic current, the positive pole of which is connected to a large well moistened sponge electrode. In experienced hands it has proven quite successful, safe and free from deleterious after effects. The disadvantages are that relatively few hairs may be removed at a sitting because only one hair follicle may be treated at a time and that the method is quite painful because of the repeated shocks at each make and break of the current and because it requires a high milliamperage to treat each hair individually.

To overcome these disadvantages multiple electrolysis was introduced and it has become quite popular in the past decade. In this method several needles are attached to the negative electrode and the positive electrode is connected to a metal cup containing water in which one hand of the patient is immersed. Many needles are on the market; some are sharp, others bulbous; some are made of platinum, others of steel. I prefer to use fine, sharp, short, platinum needles because with them one can more easily enter the follicles with narrow mouths frequently encountered. A good source of illumination is essential; the light should be adequate and should not give too much heat. To magnify the mouth of the follicle binoculars are used.

Before inserting the needles one must bear in mind that the follicles have an oblique position in the skin and therefore it is necessary to follow the direction of the hair follicle. If this is done, the needle may be gently slipped into the follicle without any force. From four to six or more needles which come from the negative pole are inserted into the hair follicle, depending upon the sensitivity of the region treated, and one hand of the patient is immersed in the metal cup attached to the positive pole. The potentiometer regulating the flow of current is adjusted so that the circuit is completed and the proper milliamperage furnished. For four needles about one milliampere is usually sufficient; for six needles, about one and one-half milliampere, etc. In from five to ten seconds bubbles of hydrogen appear about the mouth of the follicle. From ten to twenty seconds is sufficient to destroy the average hair follicle. An attempt is then made to remove a hair from one of the four or six follicles treated, and when a hair is extracted the needle to that follicle is withdrawn and inserted into another follicle. The average treatment may be continued for a half hour or longer. No local anesthesia is required.

If one has access to a direct current supply

one may utilize this source of energy after it has been reduced by a suitable rheostat. Since direct current is usually not available, dry batteries are popular. Six batteries joined in series are sufficient. The connections shown in the diagram (Fig. 1) have been found to deliver the most uniform current.

SUMMARY

The advantages of multiple electrolysis are as follows:

1. Less milliamperage is necessary to destroy the follicle.

2. There is less danger of scarring or other complications such as dryness or atrophy of the skin.

3. The method is more rapid, more can be done at one setting.

4. It is less painful than single electrolysis because once the flow of the current is started there is no repeated make and break of the current.

5. In comparison with the report cited on diathermy multiple electrolysis does not produce roughness or dryness of the skin and is not followed by recurrences.

6. The apparatus also offers the advantage of being so constructed that it is impossible to reverse the connections and attach the needles to the positive pole which tends to produce scarring and permanent pigmentation if a non-platinum needle is used.

BIBLIOGRAPHY

1. Freund, L.: Wien. med. Wchnschr., 47: 428-434, 1897; Elements of General Radiotherapy, New York, Rebman Co., 1904, p. 229.
2. Schwenter-Trachsler, W.: Arch. f. Dermat. u. Syph., 111: 69-76, 1912.
3. Bordier, H.: Am. J. Phys. Therapy, 8: 273-274, 1832.
4. Michel, Chas. E.: St. Louis Clinical Record, 2: 145, 1875.

185 North Wabash Avenue.

OBSERVATIONS ON THE PUBLIC HEALTH OUTLOOK

FRANK J. JIRKA, M. D.
Director State Department of Public Health
SPRINGFIELD, ILL.

If an observing person were to lift up his eyes to the health horizon today, the things that would strike his vision are apt to depend very largely upon the direction in which he looks. If his face is toward the east, from which flows in penetrating waves the bright sunshine of newer knowledge, he may feel abundantly justified in predicting fair weather for a long time to come. If his gaze is to the west however, where hang the thunder clouds of economic chaos and ignorance that cast threatening shadows across the stream of light, he might expect stormy weather ahead. If he looks to the south, with its mist of human inertia, or to the cold north where shines the star of steadfast purpose in the application of knowledge already at hand, his reaction would tend toward pessimism or hope as the case might be.

The outlook with respect to tuberculosis fits exactly into this picture. On the one hand, we find an abundant store of knowledge to which new discoveries and ways of utilizing knowledge are constantly added. We see in statistical reports for recent years evidence of a steady decline in mortality. To look only in this direction, there seems to be no obstacle in the way of continued progress and continued improvement, until the day when tuberculosis would cease to be a problem of substantial importance.

Another view casts shadows of doubt upon the prospects of rapid gains against tuberculosis within the immediate future. During the first quarter of 1934, the diagnostic laboratories of the State Department of Public Health were called upon to examine for tuberculosis a greater volume of specimens than in any previous period of like duration. Compared with the first quarter of 1933, laboratory tests for tuberculosis were up eleven per cent. Of even more significance is the fact, that the proportion of these tests found to be positive was nearly as great as last year.

Likewise, case reports of tuberculosis were substantially higher in the first quarter of 1934 than in the corresponding period of the year before, an increase of about 7 per cent. For February and March of this year, 18 per cent. more cases were reported than in those months of 1933. Whether or not these trends are temporary and transient, remains to be seen. They at least suggest a halt in the progress made against tuberculosis during the last decade.

In Pennsylvania, according to a report from the State Department of Public Health, the incidence of tuberculosis among certain groups of children examined by the field staff of that

Read before the annual meeting of the Illinois Tuberculosis Association, Mt. Vernon, Illinois, April 30, 1934.

Department was 33 per cent. greater in 1932 than that found among similar groups two years earlier. This greater prevalence the report attributes to malnutrition, and other untoward effects of the economic depression.

During the last three months in Illinois we have experienced a higher prevalence rate of scarlet fever and whooping cough than in the corresponding period of any year for more than a decade. We are now in the midst of an epidemic wave of measles, the heaviest in several years. Is it too much to believe that the extensive prevalence of these diseases may open up the avenues for tuberculosis? Can we say with confidence that these epidemic conditions are but the manifestations of the natural cyclic incidence curves of contagious diseases, and have no relation to the tardy influence of the economic depression? Regardless of the causes of these unfavorable trends, they are conditions that must be considered in the public health programs of the immediate future.

If we may now examine the history of the anti-tuberculosis movement in Illinois, there appear certain factors that are not overwhelmingly encouraging. At one time the hope of progress against tuberculosis was pinned to the sanatorium movement. Doubtless the theory was, and is, sound in almost every respect. While the movement was in the ascendancy, 16 county and 2 municipal sanatoria were constructed or acquired. Perhaps one-third of these have been equipped and operated, so that results are beginning to justify the high hopes and expectations of those who labored in season and out to bring them into existence.

These sanatoria which have become the centers of well planned and wisely executed programs, are found in most cases to be woefully inadequate to take care of legitimate demands of the tuberculous population. Those that fell into ways of indifference with respect to equipment, personnel and programs, have become a drug and burden upon the communities that sought through this movement to solve their tuberculous problems. At the very moment moreover, when by every rule of logic and reason, the sanatorium facilities and the tuberculosis program should have been stepped up, retrenchment was the order of the day. When social conditions and unemployment increased the liability of tuberculosis, the pressure of unfavorable economics impelled a reduction in the medical and nursing services, and a decrease in sanatorium facilities.

What I have said refers merely to the clouds and mist that fret the horizon, and lower the visibility of progress with our present program in this important field of service. Students of tuberculosis who have earned the right to speak with authority declare, that if nothing more is ever learned about this disease, mankind can take the knowledge now at hand and by proper application completely eradicate the disease. This statement is a challenge of the first magnitude. We point with righteous pride to the falling death rate as evidence of the fundamental soundness of our program. In the light of newer knowledge and past experience however, some changes and modifications may be necessary in order to go forward with satisfactory speed toward the goal of complete eradication.

Two improvements in the general set-up and program suggest themselves. One is, the possibility of vaccination. The other is a closer, stronger and more comprehensive organization of the public health agencies and workers of Illinois. With respect to vaccination there has been in this country a divided opinion. Evidence has accumulated however, that indicates great promise through the application of this procedure.

About thirty-two years ago, Calmette and Guerin undertook the preventive research with BCG. Up to 1921, they practiced a multitude of experiments on all kinds of sensitive animals and had become, as a result, quite convinced that BCG was not only harmless but also capable of preventing tuberculous diseases. It was in 1921 that the vaccine was first given to a human. It was administered to a baby, newly born from a mother dying of phthisis. From 1921 to 1924 many other infants were vaccinated with excellent results.

The procedure gained progressive acceptance both in France and elsewhere. Since 1924 especially, it has made remarkably rapid strides, until in 1932, in France *one baby out of every five born was vaccinated.* It is not in France alone however, that the procedure has become popular. It has gained large acceptance in many other countries, particularly in the French col-

onies, the Latin-American countries, and other countries in which French influence is a determining factor.

According to Calmette, the tuberculosis mortality in vaccinated children is greatly decreased. More interesting still, he found that the general childhood mortality is much less in vaccinated than among unvaccinated children. In his figures he quotes a total of 443,658 children vaccinated in forty-six different countries outside of France. From this huge total of approximately half a million babies he quotes a general mortality for vaccinated children of 7.9 per hundred against 15.3 per hundred for non-vaccinated children. In other words, there was a reduction in favor of the vaccinated children of 50 per cent.

It must be recalled that we are speaking of general mortality, not that caused by tuberculosis only. According to Calmette, the mortality in France from tuberculosis among non-vaccinated children born of tuberculous mothers, or raised in tuberculous surroundings, is 15.9 per cent, as against 3.4 per cent. for the vaccinated.

In Rumania, from a study of 60,000 vaccinations and controls, the mortality from tuberculosis in contact controls was 25 per cent. in the non-vaccinated cases, as opposed to 1.3 in the vaccinated infants living under similar conditions.

In sixteen foreign countries exclusive of France, where the number of children vaccinated ranges from 600 to 100,000, the general mortality rate among the vaccinated, whether the number is large or small, has been uniformly and substantially lower than that among the unvaccinated.

A beginning has been made in our own country. The experience of Park in New York City has apparently been no less satisfactory than that in other countries. In reply to my request two weeks ago Dr. Park wrote to me as follows:

"Our results with BCG vaccination have been very favorable. There has not been the slightest evidence of harm, and definite resistance apparently develops against tuberculosis. As you know, we practically alternate our cases and give the same instructions to both sets. The death rate, therefore, is very low, only three per cent. during the first year in the controls, and 0.5 per cent. in the vaccinated."

More recently the Board of Directors of the Chicago Municipal Tuberculosis Sanitarium has decided to undertake a program of vaccination. Dr. Tice, its president, and Dr. Hruby, the secretary, observed the procedure and investigated the results in France personally. They were convinced that a large scale application of BCG vaccination in our American communities would have a very definite influence in solving our tuberculosis problems.

Convinced of the practicability and feasibility of the procedure they set about organizing a program. The first step was to send to the Pasteur Institute in France a qualified physician, Dr. Rosenthal of Chicago, to study the problem. Working under the eyes of Calmette and other pioneers he acquainted himself through observation and practice with every detail, not only with the bacteriologic routine, but with the various clinical applications as well.

Dr. Rosenthal arrived back in Chicago about a month ago, bringing with him a supply of cultures. He is installed in a laboratory in the University of Illinois Medical School, completely isolated, with no connection whatever with any other laboratory unit. He and his assistants alone are allowed to go into the laboratory on any pretext.

For the next six months, the laboratory work involved in preparing the BCG vaccine will go forward with infinite care. At the end of that period, after the cultures have been thoroughly tested with animal inoculation, a program of clinical application will begin.

The vaccination program in Chicago will be undertaken as a practical means of attacking the tuberculosis problem along with the inadequate, but excellent sanitarium facilities, and the extensive medical and nursing program.

In that city it seems that expenditures for sanatorium and hospital facilities for tuberculous patients have been about all that the budget will bear. There is no prospect that these funds can be greatly increased in proportion to the need. At the same time, the number of beds available, fall far short of immediate requirements to satisfactorily meet the situation. A recent report from the Sanitarium Board indicated that there are 11,000 patients who need sanatorium care, and that the total number of beds available in all institutions is 2,200.

A similar situation prevails down-State. For the greater part of this area, there are no public sanatoria facilities. Where sanatoria exist, and

effective programs prevail, the facilities are wholly inadequate to meet the needs. This situation recommends vaccination as a way out. I submit the proposal for your earnest consideration.

With respect to an improvement in the organization of public health agencies much can be said. In other fields of endeavor strong Statewide organizations have been able to secure desirable legislation and public appropriations much easier than in the field of health. Social workers, for example, seek and obtain legislation almost at will. Backed by the Illinois Conference on Social Welfare their demands for laws, and for money, carry a weight that is seldom disregarded. The farmers, the veterans, the municipalities, the beekeepers, undertakers and anti-vaccinationists, make demands that result in new laws, and often in liberal appropriations. The voice of labor never goes begging for an audience of the legislative ears.

The public health forces are the one outstanding example of unorganized effort in Illinois in the field of general interests and public service. At the same time they have the most useful and the most desirable commodity in the world to offer in return for the support of their program. In closing I also therefore submit the remedying of this, as a proposal for your consideration.

ROENTGENOLOGY OF THE ALIMENTARY TRACT

M. J. HUBENY, M. D.

CHICAGO

Since the discovery of the x-ray in 1895, many technical improvements in equipment have made it possible to use this apparatus in ever expanding circles; more precise methods of investigation made possible a greater clarity in diagnosis; diseases and their expression were capable of better analysis and assembly, and an experience table was promulgated so that some of the data and phenomena were conclusive, some were supportive, some vague and not understandable, while negative values were sometimes as valuable as positive ones, in this manner positive hypotheses were ruled out by definite negative findings. But even in spite of the wonderful apparatus, judgment is a human attribute and is distinctly individualistic, so in the final analysis the value of any diagnostic procedure is dependent chiefly on the ability of the individual. This dictum also holds true in Roentgenology and especially in that phase which concerns the alimentary tract.

From embryonal to mature development, the alimentary tube undergoes some interesting changes that involve a high degree of specialization of a physical and physiological nature, including the development of accessory structures such as teeth, salivary glands, biliary system and pancreas. As a consequence a wide range of disturbances is possible and necessarily, many technical procedures have been developed.

Unfortunately in the performance of these investigations a large investment in apparatus is necessary, the cubic area is large and consequently, an actual expenditure of money is unavoidable. Under existing financial conditions certain practices have become firmly intrenched and unfortunately condoned by certain medical men, who are members of organized medicine. One of the most flagrant has been the selling of a definite number of films such as four or six, plus a cursory fluoroscopic examination under the pretense of thoroughness; this, on the surface is dishonest, for how can any service be stereotyped, much less a service dealing with so many phenomena and their vagaries? Medicine is a profession; a profession is a trust which has a keen sense of public responsibility and it is the writer's conviction that, as economic conditions reach the stage of better equilibrium, there will be evolved a higher ethical standard in all activities, which has at all times been the objective of right minded people.

In approaching this problem, it is definitely accepted and understood that the roentgenologist realize his contribution without enthusiasm or exaggeration and that because of the magnitude of medical services, team work is essential; in this manner he will receive wholesome acceptance by his colleagues in other branches of medicine. In pursuance with this policy, the roentgenologist should be consulted as to the procedures necessary, their method of application and permitted to make suggestions as to sequence, continuation or repetition of observations, as it is rather difficult to make conclu-

Read before Joint Session Illinois State Medical Society, at Rockford, May 23, 1935.

sions on inadequate, confusing or simulating signs and symptoms.

The movements designated chiefly as peristalsis decrease in frequency as we go caudal-ward consequently as we reach the colon, more especially the iliac and pelvic colons, we note a relatively dormant activity. Because of this, various contrasting media are used; they may be opaque or radiopatent; the method of administration might be oral, rectal or intravascular; they might be used in varying sequence or alone according to indications. It might be permitted to state at this time, that the roentgenologist be informed of the salient symptoms or clinical possibilities, which should be used by him without bias or prejudice.

This paper will not be as comprehensive or voluminous as its title would lead you to think, for this subject is almost inexhaustible. It will touch chiefly with certain critical areas, areas of predilection, injecting a personal observation or an accepted premise.

Teeth: In 1919 the writer expounded his thoughts on the value of the radiogram and decided that it was not conclusive as to whether or not an infection was present. It is the best method known today with the questioned tooth in situ, but it does not go far enough. His deductions were based on clinical findings. Later, Russel Haden approached the problem in a different manner. He extracted over thirteen hundred teeth as surgically clean as it was humanly possible and cultured the roots in suitable media. He then grouped them into five classifications. First, positive x-ray findings, no bacteria present. Second, equally positive x-ray findings, many bacteria present. Third, a devitalized tooth involved in high grade alveolar absorption, due to pyorrhea, no peri-apical involvement, no bacteria present. Fourth, a vital tooth involved in high grade alveolar absorption due to pyorrhea, no peri-apical involvement, many bacteria present. Fifth a small retained root with questionable osteoporosis in its vicinity, many bacteria. This demonstrates quite definitely that the dental radiogram is not incontrovertible evidence of the presence or absence of infection. Since this is true, and since Rosenow has proved that a granuloma is always infected, it is quite unsafe to retain dead teeth even though the radiogram shows nothing.

Peculiarly enough, frequently, there is a total absence of pain. This gives one a sense of false security, however, it has been the experience of all of us that the value of pain, which is not to be disregarded, should not be overemphasized.

The determination of the rôle of the radiogram is of importance, for we are fully aware of the consequences of infections and their products and the necessity of removing all foci of infection, if possible.

Gall-bladder: In the routine examination of the gall-bladder, a preliminary examination is always desirable to demonstrate the possible presence of a stone. This may be positive to the extent of about 35%.

Cholecystography, initiated by the work of Graham, has now taken its place as a routine method of examination when the biliary system is at fault. Its diagnostic accuracy has been developed to such an extent that it is unusual to perform an operation prior to cholecystographic study. The method of administration is of secondary importance, since the drug and management of the patient has been agreeably perfected. However, as Kirklin has stated, "Choice between oral and intravenous administration of dye is not involved, for I am convinced that the oral method if properly applied, is ordinarily as reliable as the intravenous method. The oral method is usually preferred and easily carried out."

Unfortunately there is a general tendency among physicians, not engaged in roentgenology, to consider roentgenological diagnosis simple and its results almost automatic. This, of course, is not so, for it may be definitely stated that the accuracy of cholecystography depends directly upon the careful attention to details, as well as upon the roentgenologist's experienced judgment in interpretation.

In gathering statistics the following is a fair evaluation. General accuracy of all cholecystographic diagnoses, 90%. Findings of poor functioning or non-functioning in 97% of the cases in which stones were found. Gallstones were manifested as dense or translucent areas in only 40%. Non-calculous cholecystitis showed evidences of disturbed function in approximately 80%, whereas in 20% the gall-bladder was apparently normal.

Normal visualization is apt to be misleading which is contrary to expectations. In the experience of Giles with 381 cases 86 showed normal

response. Twenty-six of these had calculi and 60 were non-calculous. Stones were demonstrated in 12 of the 26 cases having normal response, and 19 of the 60 cases of non-calculous cholecystitis showed deformity of the gall-bladder shadow, leaving 55 cases in which no disease of the gall-bladder was reported by x-ray examination, a general diagnostic error of 18 per cent.

Alimentary tract: This tube or canal is surrounded by many structures. Its length of about thirty feet requires alert observation, because of extra-alimentary or intra-alimentary causes, either reflex or due to pressure. Among the former must be mentioned hypertrophic spondylitis with the possible production of radiculitis as described by Bechterew. The symptomatology might simulate esophageal, gastric, duodenal, biliary, pancreatic or colonic disease, or a dilated aortic arch may press on the esophagus, or a mediastinal neoplasm might produce pressure defects. Intrinsic disease processes are exhibited by actual organic defects, spasms or hypo-or hypermotility. With these manifestations, mobility and pain on pressure may be elicited, for it is implied that thorough fluoroscopic and radiographic procedures are utilized. It should be stated at this time that there are many instances where many films are necessary to record small manifestations of organic changes which cannot be observed fluoroscopically and whose repetition and constancy are vital observations.

An interesting and confusing observation is occasionally noted as the opaque meal enters the lower pharyngeal cavity; the meals seems to accumulate in the valleculae for a brief interval, which in cases of marked inanition, become accentuated because of lack of fat. These are not to be construed as diverticulae or pathological sacculations.

Time will not permit an extensive discussion of gastric ulcer or carcinoma, however, the roentgen examination is invaluable in these cases. The surprising thing is the magnitude of a lesion in the absence of many subjective symptoms. As stated earlier in this paper, clinical history and other laboratory methods are to be considered and evaluated, but one is frequently surprised at the size of the lesion which is at such variance with other findings. We know of the unreliability of anemia, achlorhydria, anorexia, nausea and vomiting; also, we are aware of the protean character of pain, especially referred pain.

Bolton has made some interesting observations on referred pain from the stomach and he deducted that certain points of tenderness elicited by light pressure over areas in the mid-line between the sternum and umbilicus might be due to gastric or duodenal ulcer or painful gastric neurosis, and also, that direct deep pressure on the ulcer area during fluoroscopy was more reliable, thereby ruling out a gastric neurosis.

It is frequently impossible to differentiate between ulcer and cancer and deductions might frequently be inferred according to the location of the lesion and its extent. The pylorus is the most frequent location of cancer, while the mesial portion of the stomach is mostly involved in ulcer; the cardia is more frequently involved in carcinoma and carcinoma is inclined to be more diffuse than ulcer.

Duodenal ulcer can be diagnosed with a satisfactory certainty, although duodenitis and chronic intermittent duodenal obstruction occasionally confuse the issue by virtue of mucosal patterns and puddling of the second and third portions of the duodenum.

Appendicitis: The chronic, low grade, recurrent form of this affliction is very prevalent and surprisingly overlooked; the symptoms are frequently bizarre, atypical and consequently misleading. Keith in his appreciation of the kinetic zones, and their relation to one another, realized that they resembled the semaphor system of the railroads, always transmitting impulses to other remote, but related zones or areas; the appendiceal area is almost like the watch tower, always sending signals to other areas, thereby being an arch deceiver. The detection of this disease is a relatively simple process and is primarily dependent on the elicitation of pain on pressure over the appendiceal area. There are other indirect signs, but they are confirmatory rather than diagnostic. The opaque meal will visualize the cecum and occasionally the pathologic appendix and will assist the surgeon in orienting the structures, for it is well known that the appendix may be located in areas far removed from McBurney's point. Most naturally care must be exercised not to overlook a kidney or ureteral stone, ovarian or adnexal involvement which may simulate a pathologic appendix.

Colon: This structure may be visualized by an opaque meal, an opaque enema and insufflation with air after attempted evacuation of the

opaque enema. Motility is best determined with an opaque meal. An enema is superior in the determination of indurations, redundancies and reduplications, also in the observation of the various forms of ulcerative colitis, whether diplostreptococcic, as defined by Bargen and Weber, or the tuberculous or amebic dysentry form, although the latter is quite difficult to recognize. Tuberculous infections in other areas, such as the lungs, will help to make a differential, while an examination of the stools for organisms will be of material assistance.

Migratory cecums, anomalies due to lack of peritoneal rotation and descent are interesting and allergies due to infections, foods and deficiency states are just emerging into a vast field for intense investigation.

DISCUSSION

Dr. Ben Hughes, Evanston: I believe that the work of Haden and Rosenow only confirms the work accomplished by Dr. Hubeny and the opinion that he expressed many years ago, namely, that whether the x-ray picture gives a positive or a negative finding the general health of the patient, in most instances, is benefited by the removal of devitalized teeth. In other words, a negative x-ray picture of a devitalized tooth does not clear this tooth of infection and many times cultures of such teeth (negative in the x-ray films) are harboring the most vicious types of organisms.

I like to look upon the roentgenologist as an expert medical consultant in his particular field and for the best results both for patient and referring physician I believe that the case under discussion or "in for diagnosis" should be clinically discussed by the roentgenologist and the referring physician.

The preparation of the patient and the technique of taking the pictures should be entirely left in the hands of the roentgenologist and I believe that if we ask the roentgenologist to give his opinion based upon looking at a plate or two we are not getting the full benefit of his ability and skill.

There is no doubt but that the x-ray is one of the most valuable diagnostic procedures which we have today. It helps us to see what is going on within the patient's gastrointestinal tract when such would be impossible by any other means now in use.

We are all familiar with instances in which the consulting roentgenologist has saved the surgeon the embarrassment of operating on a suspected case of acute appendicitis when the x-ray pictures reveal a stone in the right ureter, or where the x-ray findings showed a pneumonic process in the lung.

Consider, too, the great value of the x-ray in the patient with a clinical history of peptic ulcer, seized with severe pain and collapse, the x-ray shows free air under the diaphragm, proving the diagnosis a perforated ulcer.

It is valuable in acute obstruction and usually a flat plate of the abdomen is sufficient without the injection of any barium enema.

In the more chronic cases a thorough and complete study of the gastrointestinal tract frequently brings to light findings which are more or less startling to the clinician for instance, a transverse colon lying between the liver and diaphragm or a mass in the right upper quadrant with or without free air under the diaphragm and with or without diverticulitis, such as we find in sub-diaphragmatic abscess.

The x-ray is of inestimable value in locating diverticula or areas of diverticulitis anywhere along the gastrointestinal tract, also in differentiating the various types of ulcerative colitis.

We know, too, that there are many instances in which a gastrointestinal lesion is suspected but the x-ray studies reveal pathology in the vertebra, possibly a malignant growth or an osteoarthritis, which causes the referred symptoms in the abdomen.

As clinicians we must give the patient every possible help which is available from a diagnostic and a therapeutic standpoint and I would make a plea for more and better teamwork on the part of both the roentgenologist and the physician.

Dr. J. P. Simonds, Chicago: Dr. Hubeny's paper rightly emphasizes the necessity of expert advice on the highly technical phases of Medicine. This applies not only to the making and interpretation of x-ray plates, but also to other forms of laboratory work. I have had occasion, as Chairman of the Committee on Medical Education in Hospitals, to collect statistical data pertaining to hospitals in Illinois. In 1934, only 50.3 per cent. of our hospitals had x-ray departments; and of these only 29.7 per cent. had M. D. directors. In most of our hospitals, therefore, x-ray films are made by a technician or a nurse whose knowledge of anatomy and of the roentgenologic problems involved is very limited, and are interpreted by an internist or a surgeon whose knowledge of such highly technical matters is almost equally tenuous and meager. In the same year, 79.4 per cent. of hospitals in Illinois had some sort of clinical laboratory, but only about half of these had M. D. directors. In other words, in more than one-half of the hospitals in this state the most highly scientific and exact part of the practice of medicine is done by mere technicians of more or less doubtful qualifications and without any adequate supervision. This state of affairs is not conducive to the highest type of practice of Medicine.

Dr. Don C. Sutton, Chicago: Dr. Hubeny mentioned arthritis of the spine as a cause in the production of abdominal pain. Ellis Kerr, in the *Archives of Internal Medicine* six or seven years ago, had an article in which they covered all the disease conditions which might be simulated by such arthritic pain—angina, pleurisy and various abdominal conditions. It is not infrequent to see patients who have been operated upon for gallbladder, appendicitis, or kidney disease, who have pain caused by the posterior roots being pressed upon by an osteo-arthritis of the spine.

BACKACHE IN WOMEN

SAMUEL J. LANG, B. S., M. D.
Associate in Medicine, Northwestern University Medical School
EVANSTON, ILLINOIS

Backache is perhaps one of the most common complaints a physician is called upon to treat. Reports on low back pain have come for the most part from orthopedic sources but have been concerned primarily with structural deformities. In many instances there is no recognizable evidence of deformity when first examined by the family physician and the complaint is therefore apt to be lightly considered.

The various acute and chronic conditions which may produce backache are too numerous to be considered. It is my purpose in this paper to discuss only what I believe to be the most common cause of low back pain in multiparous women.

Most obese, multiparous women complain of low-back pain during the menopausal decade. This complaint is also quite common among thin women who have borne children and is practically universal among the so-called psychoneurotic or psychasthenic groups of all ages. The frequent absence of x-ray evidence to account for this disturbance led us to seek other possible causes for backache than bony changes. [1, 2, 3]

The most difficult task one encounters is to properly evaluate the importance of various minor ailments of which these persons commonly complain. Flat feet, poor posture, retroposition of the uterus, devitalized teeth, suspicious tonsils, constipation and hemorrhoids are some of the conditions to be considered. In addition there may be fatigue or an anxiety neurosis based on economic or marital difficulties. It is customary to incriminate one or more of these faults if no structural changes are seen on the x-ray films. Each of these faults has been championed as the primary cause of backache at one time or another and may, indeed be the sole cause in some instances.[1, 2, 4, 5, 6, 7, 8, 19] We feel that in the type of patient described, these conditions are more apt to be contributing factors which accentuate long standing mechanical changes.

The normal vertebral column is arranged in a series of four curves, an anterior cervical and lumbar curve and a posterior dorsal and sacral curve. It is obvious that the force of gravity from the weight of the torso must be transmitted by way of the vertebral bodies through the intervertebral discs and their contained nuclei. The nucleus pulposus is a soft, gelatinous mass which acts as a fulcrum or bearing, for the movements of the spine. By virtue of its expansile force it equalizes and absorbs the force resulting from the superincumbent weight. The force of gravity is then exerted through a sinusoidal column while the line or plane of gravity must necessarily remain vertical. The intervertebral discs are compressed on the concave side and expanded on the convex side of each curve to correct for the change in direction.[9, 10]

The line of gravity as located by Schmorl, Calve,[9, 10, 11, 12] and others is said to pass posterior to the bodies of the lumbar vertebrae and to bisect the sacroiliac joints. By a specially devised tilt table we find that this line varies with the height of the heel and the body build and have therefore been unable to establish a non-variable normal line of gravity.

Compensatory changes occur in the spine in response to an increase in the convexity or concavity of any of these curves. Thus during pregnancy there is an exaggeration of the normal lumbar lordosis with compensating changes in the sacral and the dorsal spines. This is facilitated by the generalized physiological relaxation of soft tissues associated with the gravid state. The pelvis being attached to the spine at the sacroiliac joints must tilt and rotate anteriorly in response to the alteration of the lumbar curve. The plane of the lumbosacral articulation is consequently changed, producing an increased sacral angle. This angle is constructed by continuing the plane of the superior surface of the first sacral vertebra to meet a horizontal line, but varies so widely in the normal that it is difficult to state what constitutes abnormality.[13, 14, 15, 16, 17, 26]

Stretching and thinning of the abdominal muscles and shortening of the long muscles of the back is the inevitable product of the combined effect of the uterine tumor, the lumbar lordosis, the dorsal kyphosis and the anterior tilt of the pelvis. After delivery it is common practice for the parturients to lie on the abdomen to facilitate return of the uterus to its normal position. This position, particularly if practiced on a soft bed, increases the deformity and as a re-

Read before Section on Medicine, Illinois State Medical Society, Rockford, Ill., May 22, 1935.

sult the pelvis tends to remain in its anteverted position.[6, 7, 13, 18, 20]

Subsequent pregnancies, obesity and fatigue further stretch and thin out the abdominal muscles and result in a permanent loss of tone in some, permitting the posterior group to exert unopposed traction. The lumbar spine now remains in a lordotic position, the abdominal muscles are atonic, thin and ineffective, the heavy posterior spinal erector groups are contracted and in a state of protective spasm. Although this condition is at times compatible with painless physical activity the inevitable result is backache.

Certain positions make for strength and stability, others predispose to strain. A joint maintained in its fully extended or fully flexed position is more vulnerable to injury than when held in the normal or midposition. In the hyperextended spine the weight bearing surfaces are improperly opposed and the supporting ligaments remain in constant tension, requiring tonic contraction of the muscles for support which soon results in fatigue and pain. At times the torso actually seems to be suspended by the soft tissues rather than to be supported through the vertebral bodies and their intervening discs.[21, 22, 23]

Whether the resulting backache is due to small joint pathology, muscle spasm or ligamentous strain is a debatable subject but is of little moment since the method for correction remains the same.

It is of importance to know that the process is reversible at this stage and ordinarily submits to such simple procedures as rest, heat, massage, adequate support and postural exercise.

If unrecognized during this stage various permanent changes or combinations of changes may ensue. I shall consider only those changes which commonly occur in the normal anatomical spine under the strain of the malposition just described.

Ligamentous Strain: Because of the disadvantageous balance imposed on the soft structures by the hyperextended spine the ligaments of the back and in particular the iliolumbar ligaments are vulnerable to injury. We believe that sacroiliac strain occurs less frequently than iliolumbar strain, although the two are commonly confused.[4, 6, 13, 27, 28, 29]

Hypertrophic Arthritis: Hypertrophic or osteoarthritis of the small joints in the lumbar region is perhaps the most common complication encountered. Obese, multiparous women at or near the menopause are very likely to show evidence of such changes. Osteophytic lipping of the 5th lumbar body and the superior surface of the sacrum may occur as a result of local infections or if the lumbosacral disc has become flattened. Lipping of the anterior margins of other vertebral bodies so commonly seen in persons above forty have perhaps no direct relation to the pain and may be considered to be purely degenerative changes. Trauma to articulating surfaces of the joints formed by the superior and inferior processes of adjacent vertebrae is the usual source of the disturbance. Because of the great variability in the angles presented by these joints in normal persons x-ray films are difficult to obtain and to interpret.[24, 25]

Horizontal Sacrum: The horizontal sacrum is the ultimate result attained in the unarrested process. That all cases do not proceed to this type of deformity is due either to unexplainable spontaneous arrest, fixation by bony or fibrous ankylosis or by the intervention of measures for correction. With a normal inclination of the sacrum the superincumbent weight is borne on a firm supporting base which results in a minimal amount of strain. The extreme change in the angle of the sacrum such as exists in the horizontal type, results in a maximum of forward and downward thrust on the fifth lumbar and the first sacral segments. The sacral angle in some of these cases may vary 90 degrees from the horizontal.[10, 16]

Migration of the Nucleus Pulposus: Migration of the nucleus pulposus has been demonstrated by Schmorl, Calve and others.[9, 10] In the type of malposition described the intervertebral disc is open on the convex side and compressed on the concave side. If the nucleus is intact and slightly mobile it has a natural tendency to shift toward the open or more spacious portion, much as a moist olive stone tends to move forward when compressed between the finger tips. The normal position of the nucleus is equidistant from the anterior edge of the vertebral body and the sliding surface of the articular processes; if displaced forward the nucleus no longer can act as a fulcrum or bearing but prevents flexion by producing a block.

Treatment: Rest in bed is fundamental. Two hours of bed rest in the middle of each day

markedly reduces the incidence of fatigue. To overcome the undesirable effects of a bed that is too soft or that sags in the middle, a sheet of composition material may be placed between the mattress and the springs. Correction of the anteverted position of the pelvis and shortening of the abdominal muscles can be accomplished by clasping the flexed knees against the chest. For greater comfort in this position a foot stool placed on the bed serves as an excellent rest for the flexed lower extremities.

Obesity is incompatible with successful management of this condition. The reasons are obvious and require no further explanation. Undernutrition is often synonymous with flabby musculature and requires as active correction as does obesity.

In the home or in the hospital hot wet stupes applied to the back at intervals throughout the day relieve the most stubborn cases. It is a simple and effective procedure.

Exercises such as the pelvic roll and straight leg raising hasten the restoration.

Some form of surgical garment is usually necessary to overcome muscle spasm, and to offer support to the back. This garment should be reinforced with semi-rigid steels in back which span the lordotic curve and exert pressure on the buttocks. An inner belt which fits above the pubes anteriorly complements the posterior pressure and together they tend to restore the pelvis to its former position.

Phenobarbital is at times almost a specific for the hypersensitivity or lowered threshold for pain, so often encountered during the menopause.

CONCLUSION

A common cause for backache in multiparous women is malposition of the pelvis resulting in ligamentous and muscle strain.

X-ray films show no bony changes in the early stages but lateral films taken in the upright position may show an increased sacral angle or a horizontal sacrum.

Complications such as ligamentous strain, hypertrophic arthritis of the small joints, migration of the nucleus pulposus and horizontal sacrum, follow some uncorrected cases.

Most uncomplicated cases respond to such simple procedures as rest, heat, massage, postural exercises, adequate support and the correction of abnormal body weight.

Backache due to orthopedic, genito-urinary, neurological or proctological causes are not considered to be within the scope of this paper.

636 Church St.

BIBLIOGRAPHY

1. Courtney, J. W.: The psychoneurotic backache. Boston M. & S. J., 189: 1061-1063, 1923.

2. Frothingham, Channing: Backache. Boston M. & S. J., 189: 1063-1065, 1923.

3. Lynch, F. W.: Lumbosacral and sacral backache. In Curtis, A. H., ed.: Obstetrics and Gynecology, Philadelphia and London, W. B. Saunders Company, 3: 493-511, 1933.

4. Osgood, R. B.: Bone and joint causes of low back pain. Boston M. & S. J., 189: 1059-1061, 1923.

5. Graves, W. P.: The relation of backache to gynecology. Boston M. & S. J., 189: 1057-1059, 1923.

6. Berry, J. M.: Painful conditions in the lumbar lumbosacral and sacro-iliac regions. Arch. Surg., 11: 883-910, 1925.

7. Kuth, J. R.: A study of 208 cases of lower back pain. J. Bone & Joint Surg., 4: 357-375, 1922.

8. Andrews, H. R.: Backache in women. Brit. M. J., 2: 1207-1209, 1925.

9. Schmorl, G.: Uber die an den Wirbelbandscheiben vorkemmenden Ausdehnungs und Zerreissungsvorgänge und die dadurch an ihnen und der Wirbelspongiosa hervorgerufenen Veranderungen. Verhandl. d. Deutsch. path. Gesellsch., 22: 250, 1927.

10. Calvé, Jacques & Galland, Marcel: The intervertebral nucleus pulposus; its anatomy, its physiology, its pathology. J. Bone & Joint Surg., 12: 555-578, 1930.

11. Von Lackum, H. L.: The lumbosacral region. J. A. M. A., 82: 14: 1109-1114, 1924.

12. Dickinson, R. L., and Truslow, Walter: Averages in attitude and trunk development in women and their relation to pain. J. A. M. A., 59: 24: 2128-2132, 1912.

13. Stein, Arthur: The relationship between gynecology and orthopedics. Am. J. Obst. & Gynec., 26: 64-70, 1933.

14. Robinson, W. H., and Grimm, H. W.: The sacrovertebral angle, its measurement and the clinical significance of its variations. Arch. Surg., 11: 911-916, 1925.

15. Wagner, L. C.: Congenital defects of the lumbosacral joints, with associated nerve symptoms. A study of twelve different types with operative repair. Am. J. Surg., 27: 311-327, 1935.

16. Miltner, L. J., and Lowendorf, C. S.: Low back pain. A study of 525 cases of sacro-iliac and sacrolumbar sprain. J. Bone & Joint Surg., 13: 16-28, 1931.

17. Ely, L. W.: Backache; Lumbago; Pain in the lower part of the back. Arch. Surg., 27: 189-202, 1933.

18. Adams, T. W.: Backache from an obstetric and gynecologic standpoint. Am. J. Obst. & Gynec., 14: 742-748, 1927.

19. Cochrane, W. A.: Low backache and sciatica. Brit. M. J., 2: 696-699, 1928.

20. Hauser, E. D. W.: Low back pain. A new explanation of the pathogenesis and the treatment. Surg., Gynec. & Obst., 57: 380-383, 1933.

21. Berry, J. M.: Painful conditions in the lumbar lumbosacral and sacro-iliac regions. Arch. Surg., 11: 883-910, 1925.

22. Key, J. A.: Low back pain as seen in an orthopedic clinic. Am. J. M. Sc., 168: 526-534, 1924.

23. Brown, L. T.: The conservative treatment of backache. J. Bone & Joint Surg., 14: 157-164, 1932.

24. Ghormley, R. K.: Low back pain. With special reference to the articular facets, with presentation of an operative procedure. J. A. M. A., 101: 1773-1777, 1933.

25. Ayers, C. E.: Lumbo-sacral backache. Boston M. & S. J., 196: 1: 9-16, 1927.

26. Kreuscher, P. H.: The orthopedic aspect of low back pain in connection with pelvic disorders. Surg., Gynec. & Obst., 45: 482-484, 1927.

27. O'Ferrall, J. T.: Low back pain—A clinical study of its cause. J. Bone & Joint Surg., 4: 384-394, 1922.

28. O'Ferrall, J. T.: Low back pain. J. A. M. A., 91: 8: 532-535, 1928.

29. Lowman, C. L.: Role of iliolumbar ligaments in low back strains. J. A. M. A., 87: 1002-1003, 1926.

DISCUSSION

Dr. Rudolph Mroz, Rockford: I am pleased to be able to open this discussion on a very important subject, because I think that next to painful feet this problem is the most frequent complaint that the orthopedic man comes in contact with. Treatment by rest in bed is often surprisingly efficient. The patient gets much relief rapidly, especially the early cases. In addition, if the patient has severe pain, I think it is wise to apply a double Buck's extension. If the patient has too much pain the extension can be removed for one or two hours. The position of flexing the thigh on the abdomen is often very gratifying. I tell my patients to stand up against the wall and to straighten their backs against the wall, but I think the horizontal position is more restful.

I believe that with continued backache anatomical changes take place. In many of these cases the x-ray does not show anything, but I believe that we should take three-quarter views in order to visualize better the small articulating surfaces.

I have a few films I would like to show to illustrate a few points. This patient had quite severe backache. The usual anteroposterior and lateral ray did not show anything, except some lipping of the sacro-iliac joints.

The three-quarters view of both sides shows up quite well the articulating surfaces of the lateral facets. There is a narrowing of the last joint space on one side with an increased density of the articulating facets as compared with the corresponding joint on the other side. The lateral joint above this one is practically obliterated by an arthritis. I have brought this up to emphasize the importance of looking further than just the usual anteroposterior and lateral x-ray views in backaches.

Dr. Robert C. Lonergan, Evanston: Backache, of course, is a subject that is of general interest because it is so widespread. It is also a subject that has been fraught with difficulty because we could not always find the specific cause for the condition. Cotton recently said that in many instances we are no farther ahead than the old negro's statement that he had "misery in the back." However, such an interesting study as this of Dr. Lang's indicates that we are getting places, and I am sure this particular angle will have an appeal.

My early memories concern fat, multiparous Jewish women complaining of backache. In studying these backs there are two factors to be considered. First, there are sometimes large fatty deposits in the pelvic region which may photograph in such a way that it appears that the pelvis is tilted forward. The other point is well established that there is a relaxation of the pelvis and the joints of the lumbar spine with pregnancy. There is no question but that repeated pregnancy increases this relaxation. In these cases there may never be again a normal physiological balance, and so, of course, these women are bound to have backache.

There is one interesting feature about this particular type of backache; namely, that treatment may be very effective and relief can be obtained.

Dr. Samuel J. Lang, Evanston (closing): I wish to thank Doctors Mroz and Lonergan for their discussions. I failed to mention Buck's extension but it is a very satisfactory method for relieving the radiating sciatic type of pain.

The fat on the hips which Dr. Lonergan mentioned is sometimes really fat, but many times it is just a hypertrophy of the gluteal muscles. In these women with anteverted pelves the glutei attempt to hold down the sacrum in order to prevent the pelvis from rotating.

MUSCULAR ASTHENOPIA

R. H. Woods, M. D.

LA SALLE, ILL.

As we usually construe it, asthenopia is visual discomfort which may be mild and occasional, or daily and severe. It may be accommodative in origin or it may be muscular or both. Invariably relieved by sleep.

The accommodative asthenope locates his headache in the temple and brow after use of the eyes. The muscular asthenope locates his headache in the occiput. The adult individual with a narrow pupilary distance of 54 to 58 is more prone to muscular asthenopia for convergence insufficiency than the individual with a P.D. of 60 or more.

A disturbed duction ratio of 2 to 2 or 3 to 3 of the vertical muscles is very troublesome but less frequent than a disturbed ratio of 1 to 4 of the lateral muscles.

Measuring the duction is very easy and not in the least confusing. For the vertical muscles the trial case prisms are quick, accurate and convenient.

A spot of light is placed at infinity, Personally I prefer a revolving target with a radius of 8 to 12 inches. 1° prism is held base down over the right, then a 2° in the same position measuring up to the point of producing diplopia. Reverse the process using prisms base up on the same eye. Then the left eye undergoes the same procedure. The usual ratio is 2° up and 2° down on either eye. One eye may not overcome as much prism base up or down as its mate in which case one knows the offending

Read before Section on Eye, Ear, Nose and Throat, Annual Meeting of Illinois State Medical Society, at Rockford, May 23, 1935.

muscle. However, if there is a discrepancy, both eyes usually show the same findings. May we say for illustration that the right eye gave 4° base down and 2° base up. The left eye will then show 4° up and 2° down. In the measurement the apex of the strong prism is over the weak muscle but in the prescription the base will be over the weak muscle. In this case we have a right hypophoria balanced by 2° base up over the right, or 2° base down on the left. As an interesting experiment one will try the Maddox rod, which will invariably give practically the same findings as the vertical duction measurements.

My experience has been to ignore a vertical phoria of 1° but to partly correct, by decentering or by prisms, a defect of 2 degrees or more. This is best done experimentally by fit-overs.

Unfortunately the lateral phorias, as shown by the Maddox rod, do not co-relate as nicely to adduction and abduction as do the vertical phorias to hyper and hypoduction; as a matter of fact, there is no relationship.

I have made it my business to run through several series of cases in the last 30 years in an attempt to establish a relationship. The last series consisted of approximately a thousand cases. Persons of low adduction would show esophoria; some would show orthophoria. Cases of normal adduction have shown exophoria, other cases of excessive adduction have shown orthophoria. One interesting case can overcome 60° base out. He has at various times shown exophoria, other times esophoria. It is needless to say that this individual is most comfortable with a slight over-correction of plus, despite the fact it cuts his distant vision perceptibly. At no time has there been any group in any series that one could select to work out a comparison or establish a relationship.

I would advise every refractionist to take the next five hundred cases that come to his office and do the phoria tests and duction tests, keeping accurate records of each. He can then and only then make a satisfactory conclusion.

Carrying out the measurement of adduction and abduction consumes but little time and puts one squarely on his feet as to the prognosis of the patient's comfort in wearing his glasses. My choice as to equipment is a prism bar containing fifteen prisms running from 1° to 15° inclusive. I use it in preference to the rotary prisms principally because of the convenience and the element of time. The prism bar is augmented by ordinary trial case prisms. As one becomes more acquainted with the work it will be found that a set of square prisms running in pairs from 1° to 30° will be convenient not alone for measurement but for orthoptic training.

One will find that the average individual will overcome 7° prism base in and out or an abduction of 7° and adduction of 30°. If the abduction runs 10° or 12° the adduction should be four times that. With an abduction of 10° and an adduction of 20° the patient is not going to wear his glasses with comfort. Prisms base in, in fit-overs for temporary use on close work are expedient but orthoptic training is the logical treatment.

The measure of the reserve convergence should never be overlooked, as a matter of fact, it is my first procedure after measuring the amplitude of accommodation. Most phorometers are equipped for this procedure. A dot and line is placed vertically at 13 inches from the eyes. A 6° prism base up or down is placed over one eye. The average individual will overcome 15° base out at this distance. When they overcome anything less than 10° they are put on orthoptic training both in the office and at home.

For this procedure in order to save time and for convenience, two good ideas were combined, resulting in the production of the Ampliometer.

The Prince ruler has been on the market and in use for over 30 years that I know of. It is scaled in accord to Donders' table. It measures the amplitude of accommodation of each eye separately. The Ampliometer is scaled in inches for convenience but corresponds to graduations of Prince. The device is a simple strip of metal about fifteen inches long slotted on the proximal end to straddle the upright on the trial frame and distal end curved for the convenient grasp of the patient. It carries a movable slide and clip. Accommodation of the two eyes is thus measured at the same time in the act of convergence.

After doing a careful manifest the slide is set at the punctum proximum of the average emmetrope of the same age, as shown on the

shaft, according to Donders. A line of 5 point print is inserted in the clip and the instrument placed in position. If the patient fails to read the type at this distance it indicates a latent error or an accommodative insufficiency. Each eye is then checked separately to determine if the accommodative power of each is equal. The approximate amount of spasm or insufficiency is determined by the addition of plus of just sufficient power to make the type legible.

With the slide in position the card is reversed and the dot and line is placed vertically in the clip. A 6° prism is placed base up or down before one eye. Two dots should appear on one line. When only one dot on one line is seen, one eye is repressing, which is much more frequent than one would suppose. If there appear two lines with a dot on each line there is a convergence insufficiency which can be measured by prisms base in of just sufficient strength to give fusion of the lines. When this occurs it will be also found that there is a lowered reserve convergence and a lowered adduction, yet the Maddox rod may show orthophoria.

Leaving the 6° prism in place and pushing the clip bearing the dot and line back to 13 inches one then measures the reserve convergence which as previously stated should be 15°.

In the so-called esophoria type, plus lenses afford relief, but never under any circumstances prescribe prisms base out for constant wear. If needed, add more plus, bifocals if necessary, even for children, to gain repression. Repressing accommodation represses convergence.

In the exophoria type or convergence insufficiency, which is the most frequent of all and the most troublesome for both the technician and patient, orthoptic training is the most satisfactory treatment. Prisms base in, set up in fit-overs for close use, may be used temporarily until the convergence can be built up.

In those cases who do not respond readily to orthoptic exercises it will be found that there is some constitutional defect or instability as a background.

If one contemplates entering the field of orthoptics he should train an assistant to do the work for the reason the field is so big and at the present time practically unoccupied. If one attempts to do it all himself eventually the more remunerative lines of his practice will be crowded out.

The most satisfactory office equipment we have experimented with, and that which consumes the least time and holds the patient's interest and attention is a revolving disc carrying a target. This, plus the Keystone views. The office treatments run from three to thirty minutes of diligent concentration by the patient to the work at hand, always ceasing at a point short of fatigue.

In convergent squint cases we have had the quickest results by a partial tenotomy plus the full hyperopic correction up to tolerance plus the development of fusion and muscle training.

In divergent squint, tenotomy and lenses to give the best comfortable vision plus orthoptics to develop fusion and build the weak muscles.

DISCUSSION

Dr. J. L. Bressler, Chicago: Dr. Woods mentioned tenotomy followed by orthoptic training. I am opposed to any form of tenotomy unless it is an anchor tenotomy. You will hear in my paper what the results have been after orthoptic training has been tried, followed by surgery if necessary, with the results always better both for fusion and parallelism.

EYE AND EAR REFLEXES CAUSED BY DENTAL PATHOLOGY

JOSEPH SHANKS, M. D.

CHICAGO

The subject of dental irritation in its effect upon the eye and ear in bringing about and influencing the course of diseases of these delicate organs is one which has, from time to time, aroused considerable interest and renewed investigation among the more scholarly observers of our day. On the other hand, it should be remarked with the best of our intentions that a good many medical men or eye and ear surgeons as well as a larger number of dental practitioners have failed to give the subject the attention it deserves, the reason not being so very obscure as one might think. Yet, what difference of opinion and what confusion! Why? What is there to the question whether pathological teeth ought to be removed or not? Although the subject has been debated for a great many years and is still debatable; although the subject as to whether all questionable cases ought or ought not to be checked up by an eye and ear surgeon is fre-

quently baffling, what is there to the mystery outside of the simple understanding of the nervous mechanism in question?

That various eye affections such as poor accommodation, muscular spasms of the eye, etc., can be brought about by irritation of the dental ends of the trigeminus was studied by a number of French, German and American observers and medical men. A French authority cited a case of muscular imbalance of the left eye of some months' duration cured by the extraction of several carious teeth. He emphasized the fact that they were not sensitive or painful teeth; that they had undoubtfully nonvital pulps. The experience of many clinicians, as well as of the author, offers abundant and satisfactory proof of the existence of about five main classes of eye reflex irritation, varying in featural characteristics only as to nerve fibers or nerve branches afflicted. Thus, for instance:

1. *The very familiar picture of vasomotor* and nutritional reflex disturbances brought about by extreme dental decay and *inflammatory conditions* of the gum, a class not unknown to the dentist and so easily diagnosed.

2. Sharp or stinging pain in the eyeball caused by reflex inflammatory conditions of the *sensory fibers of the fifth nerve due to* irritation of a live pulp, oversensitive dentine or by an exposed cavity in some tooth.

3. Certain spasmodic or paralytic affections of the eye muscles, etc., may occur as a result of abscessed or dead teeth. Such conditions often tend to baffle the patient as well as the dental practitioner, *especially after a superficial hasty* examination on the part of the doctor and the confusing interpretation of symptoms on the part of the patient who generally suffers no pain.

4. Eye strain or eye fatigue attributed to the reflex action of dead teeth and gum abscess, a condition brought about through irritation of the nerves of the ciliary muscles or oculomotor nerves.

5. Important functional disease like neurasthenia may be the direct result of dental pathology and brought about through the irritating action of the sympathetic ganglion connected with the fifth nerve as well as with the eye.

Now, as to the question or problem whether pathological teeth ought to be extracted (leaving out extreme carious dentures). Why not consider the medical, ophthalmological or otological standpoint? The answer is simple and logical. Some cases respond to superficial and average dental hygienic treatment. Others, due to systemic or inherited nervous tendencies are unable to stand the strain of nervous irritation, whether from dental or any other source, are exhibiting such symptoms as vertigo, eye manifestations, headaches and neurasthenia. Neurasthenia will often incapacitate the patient and keep him more or less in constant ill health. In such cases, from a medical standpoint, there is only one solution to the problem, namely, the eradication of the main focal point and restoration of the patient to normal health in reward for the loss of such teeth.

Closely allied to such eye conditions of a reflex nature as mentioned above, are the more interesting *ear conditions produced by dental irrita*tion in a similar manner as in the eye. A German observer and writer, Rau (Berlin, 1856) stated in his work "Ohrenheilkunde" that dentition in many young children causes more or less *irritation to the external ear apparatus. Another* early observer, Sexton, an American (New York, 1880) published a number of scientific and elaborate articles concerning the effects of dental irritation on the ear. A more comprehensive ac*count of earache in children, excited by reflex* action due to dental irritation, perhaps, among earlier authorities, is to be found in the work of Woakes, published in 1880 (Philadelphia).

In "System of Diseases of the Ear, Nose and *Throat," Colles, in a chapter on the middle ear,* quotes from a work of Woakes and writes about the anatomic points of the nervous relationship between the ear, gums, teeth, mouth, nose and pharynx as follows:

"The nerves composing the group now called the tympanic plexus are brought into intimate relations with those of the throat, mouth, etc., through branches arising mostly from the otic, petrosal and spheno-palatine (Meckel's) ganglia. By means of the otic ganglion the inferior maxillary or third division of the fifth pair is connected with the plexus, while from the petrosal ganglion of the glosso-pharyngeal nerve arises the tympanic or Jacobson's nerve, which constitutes the largest portion of the tympanic nerve supply. Connection between the tympanic plexus and the second division or superior maxillary branch of the fifth pair exists also by means of the Vidian nerve through the spheno-palatine ganglion. The carotid plexus of the sympathetic, furthermore, is connected with the glosso-pharyngeal by means of the small carotid-tympanic branches of Jacobson's nerve; communication between

the ear and the superior cervical ganglion of the sympathetic is thus established."

For detailed study of other smaller nervous connections, the above author refers the reader to the standard text-books on anatomy.

So, from anatomic-physiological considerations we can thus see how these complicated nerve connections bring about disturbances owing to dysfunction—how the ear is affected through the sympathetic relationship with trouble arising in certain remote or adjacent organs of the body, such as the genitourinary system, stomach, heart, mouth, teeth, nose, pharynx, soft palate, etc. In other words where pathological conditions have long existed the nerve supply will become altered and reflex phenomena be naturally manifest. Thus dental pathology, especially infection from long standing, may bring about trophic or nutritive changes to local tissue and is liable to cause some perverted nerve action in some other part as well.

The conclusions from the following two typical cases, in the form of questions and answers between the dental surgeon and patient, may be deduced from the foregoing study:

Case 1. Mr. Johnson visits his dentist who asks:

"What is wrong today, Mr. Johnson?"

"Why, don't you see my inflamed eye? The eye doctor told me to have my teeth checked up, so I came."

"Do you have a toothache? "

"No, but he wants me to have my teeth examined just the same."

"Didn't I see you about two months ago and told you that you were O. K."

"But my doctor—"

"Hmm. Sit down and let me see."

Dentist after a superficial glance: "I don't see anything wrong. Probably a cold in the eye."

"I suggested that to the doctor who only laughed merrily and said that there is no such animal—that eyes catch no cold."

"He is probably right. However, the idea of your good teeth being a cause of your inflammatory eye condition is, of course, nonsense."

"Oh, yes, doctor; the eye doctor advised an x-ray at once. Shall I take it?"

"If you wish. An x-ray can do no harm."

"I see. I shall go then to the laboratory today."

"All right."

The above was a typical case—a pathological reflex case as revealed by x-ray showing a pathologic area associated with the mesiodistal root of the upper left first molar. Extraction of tooth brought on speedy recovery.

Case 2. Mrs. Smythe came to the dentist on a particular mission. She was suffering with a certain amount of dull pain periodically in her right ear. She had been recently reading in a newspaper about teeth in relation to other organs. She remembered seeing an article by Dr. Jones in which the statement was made that there are some teeth better out than in; that some teeth are nothing more or less than a menace to health. This, to her, was quite interesting as evidenced from the fact that she suffered on and off from earache. Like many a patient, she felt that if the tooth-extraction procedure could be safely dispensed with, she naturally preferred this; if, however, those teeth must come out, she would have no hesitancy in having them pulled. So it is in an anxious frame of mind that she comes to her dentist.

"What brings you here, Mrs. Smythe?"

"Oh, I'd like to have a little talk with you about my teeth—about my earache."

"But what is your specific complaint?"

"I don't exactly know; I'd like you to look my teeth over; perhaps they cause my ear trouble."

"You condition is probably due to a cold. I shall, however, examine your mouth." After a short and rapid examination, the dentist said: "Nothing is wrong with your teeth or gums. As I said before, probably an exposure to cold."

"Well, do you advise seeing an ear surgeon?"

"Is there any pus discharging from your ear?"

"No."

"Then I don't know what to advise you. Suit yourself."

Ear and x-ray examination revealed pathological conditions of upper third molar, with beginning absorption of the roots.

SUMMARY

Although a good deal more could be written on the subject to prove, even to a greater degree, the effects of dental irritation on the eye and ear, enough has been stated, the author believes, to call attention to the more frequent source of such trouble. The type of patient who should receive the benefits of thorough study and cooperation by the dentist and oculist-aurist is the one:

1. With vasomotor and nutritional disturbances.

2. With acute pain in the eye or ear without apparent inflammatory or suppurative manifestations.

3. With neurasthenia induced by the irritation of the sympathetic ganglion connected with the trigeminus and the eye or ear. In such cases we not only have the inherited morbid tendency to deal with that causes functional neurosis in susceptible cases even insanity.

4. With spasms or paralysis of the eyelids caused by bad teeth and alveolar abscesses. The patients generally have no pain or toothache ex-

cept from the ill effects of the afflicted muscles.

25 E. Washington St.

BIBLIOGRAPHY

Sexton: Ear, Nose and Throat.
Rau: Ohrenheilkunde (Berlin).
Shanks: Neuroses.
Woakes: Second Edition (Philadelphia).
Wood: The Eye—Practical Medicine Series, 1923.
Kirke: Handbook of Physiology.

THE SYMPTOMS AND DIAGNOSIS OF CORONARY OCCLUSION

JAMES G. CARR, M. D.

EVANSTON, ILL.

About this time of the year, twenty-two years ago, there appeared in the Journal of the American Medical Association a paper on coronary thrombosis, from the pen of Dr. James B. Herrick,[1] which has long since been recognized as a classic of medical literature. It seems a work of supererogation, almost presumptuous, to undertake to do again what has been so well done. In spite of the present wealth of literature upon the subject, the original article remains a mine of information and a model of clear-cut, forceful and thorough presentation.

A description of the symptoms of coronary occlusion may well be prefaced by a quotation from Herrick's first paper:

"The clinical manifestations of coronary obstruction will evidently vary greatly, depending on the size, location and number of vessels occluded. . . . No simple picture of the condition can, therefore, be drawn. All attempts at dividing these clinical manifestations into groups must be artificial and more or less imperfect. Yet such an attempt is not without value, as it enables one the better to understand the gravity of an obstructive accident, to differentiate it from other conditions presenting somewhat simlar symptoms, and to employ a more rational therapy that may, to a slight extent at least, be more efficient."

Preceding the characteristic symptoms of a coronary occlusion, the patient often relates a story of minor pains, at first regarded with indifference. These premonitory signs are likely to include some variety of stenocardia, slight pain or a sense of tightness within the chest, which may be associated with the radiation of dull pain, especially to the arm. Oftentimes, epigastric distress, vaguely described as to location and character, may co-exist with the thoracic distress or may occur alone.

If the patient has had previous attacks of angina there is no question in his mind as to the difference between these attacks and a frank attack of coronary occlusion. The onset of a severe attack is usually characterized by agonizing pain, wholly unlike anything hitherto experienced. The pain is described as a sense of pressure or constriction in the chest, often with burning, a pain that "cannot be told." Nausea and vomiting are often present as initial symptoms. There is a sense of prostration, great weakness and often a feeling of impending death. Usually the pain is referred to the left arm, often to the neck, the jaws, the right arm or the upper abdomen. The face is ashy, the features that of one in almost unbearable pain, the pulse is rapid, the patient may break out in a sweat. When the blood pressure has been known before the attack, it is often found to have fallen with the onset of the symptoms and usually is decidedly below the original level within a few hours. The low pressure persists for some time. Cyanosis may be marked from the start, or develop later. It is especially prominent in cases with pulmonary edema which is a rather frequent complication of the severe attacks. The congestion in the lungs may be so severe as to produce hemoptysis. One of the most confusing of symptoms is the referred pain to the abdomen, about which more must be said in the discussion of diagnosis. Abdominal distension may be a prominent symptom.

The physical signs are particularly referrable to the heart and lungs. The pulse is usually rapid, often irregular, occasionally slow. In one instance we have seen complete block occurring within the first forty-eight hours of the attack. In another case, paroxysms of ventricular tachycardia started within the first twenty-four hours. In Herrick's original report he says of the pulse, "In all the sudden development of a weak pulse. with feeble cardiac tones, was a striking feature; the pulse was generally rapid." Allbutt[2] speaks of "the flutter and lability of the heart, the rapid, irregular and failing pulse, the waning cardiac sounds, the dyspnea and cyanosis." The heart sounds are of significance. The tones are often distant; this may be due to cardiac weakness alone, although the emphysema of which Herrick speaks is often a factor. Gallop rhythm is common. Various writers speak of the alternating pulse; it has been my own experience that the various beats are unequal in force though the rhythm be regular, but this inequality of beat does not often produce a regular alternation;

when the blood pressure falls notably and the pulse pressure is low, it is not easy to determine the alternating pulse. A precordial friction rub, a finding of diagnostic importance, is often present. Fever, leukocytosis and a pericardial friction rub constitute a diagnostic triad of importance, particularly in those cases in which diagnosis is difficult. In practically all the severe cases, moist rales may be heard at the bases of the lungs; when the diagnosis is in question the evidence of pulmonary congestion or edema is important, especially if this is bilateral. Pulmonary edema, extensive in degree, may occur; this is a complication of major gravity.

Symptoms referrable to other organs are largely the result of the violent disturbance of cardiovascular function. Rapid lowering of the blood pressure is probably a principal cause of the diminished output of urine, though this may be aggravated by sweating, or the inability to take fluid. In a patient who has had for years, moderate or marked rise of blood pressure, the sudden fall of pressure may be cited to explain the cerebral symptoms, although the pain, the profound emotional disturbance, and the necessary sedatives may be partly responsible for mild delirium or a semi-comatose condition. The occurrence of emboli through the body may ensue shortly after the attack. This phenomenon is always ominous. In three instances I have seen well-developed peripheral gangrene, once in the forearm and twice in the lower extremities. Cardiac failure of the congestive type, with edema elsewhere than in the lungs, develops in a fair proportion of the cases. The milder forms are not particularly significant, but generalized edema is a symptom of serious import. Usually the patients who develop this condition do not survive, yet I recall one patient now living in fair health, who had extensive edema for weeks subsequent to a coronary occlusion about three years ago.

One important group of cases is characterized by the absence or the insignficance of cardiac pain. In his first paper Herrick stated that "cases with little or no pain have been described" and cites the mention of such cases by Chiari, Thorel and Huchard. Obrastzow and Strachesko,[3] in their paper published in 1910, included two cases in which painful sensations were almost entirely lacking. What they designate as a status dyspnoeticus or asthmaticus was observed, accompanied by a rather marked type of Cheyne-Stokes respiration. In a paper published in 1929 Herrick[4] says: "There is no doubt that there are cases with mild pain or with no pain at all. . . . In one case, otherwise perfectly typical, weakness and dizziness marked the onset, and even several hours later there was no pain requiring morphine, merely a precordial distress." N. S. Davis[5] reported two cases of the abrupt onset of the symptoms of congestive failure ushering in a long period of decompensation, with autopsy. Old myocardial infarction was found in each. No history of pain had been given.

During the past ten years there have been 53 cases of coronary occlusion at the Evanston Hospital; the records of three of these contain no reference to pain. Two of the three cases were known to me. A man of 60 was admitted five days after an attack of unconsciousness followed by weakness. When seen at the hospital on the fifth day of his illness, after he had finally consented to accept rest in a hospital, our first impression was that he had not sustained a coronary occlusion but had merely undergone an attack of faintness following an unusually trying emotional stress. The electrocardigram showed a deep Q-wave in Lead III and a sharply deflected deep T-wave in the same lead, upon which the diagnosis of coronary occlusion was based. The subsequent course confirmed the diagnosis.

A woman of 66, a known diabetic, was admitted with a diagnosis of diabetic coma. The diagnosis was largely based upon the previous history, her known reluctance to accept dietary restrictions and to take insulin, and a history of nausea and vomiting for two days. She was not unconscious when she reached the hospital, but was very dyspneic and cyanotic and her death within an hour was ascribed to edema of the lungs. No history of pain was obtained from her relatives. The left coronary artery showed marked yellow thickening; about 8 cm. from its origin it was completely obliterated by a fresh thrombus. The right coronary artery showed a marked amount of yellow thickening and 5.5 cm. from its origin the lumen was almost completely obliterated. The third case was that of a man who was admitted on the fourth day of his illness. The onset was with dizziness, headache, sweating, faintness and nausea. He was at his desk when these symptoms came on. Upon admission he was cyanotic and dyspneic; the blood

pressure was 92/75. The electrocardiogram showed marked abnormality with a Pardee wave in Lead I. The nurse's notes include frequent references to "difficult breathing" and "labored breathing" and to cyanosis, but pain is not mentioned. Autopsy revealed "recent thrombosis with complete obstruction of the descending branch of the left coronary artery."

The subject of coronary occlusion without pain, or with pain equivalent, deserves further study. At present, dogmatic assertions must be avoided. We do not know enough about individual reaction to pain to speak too confidently of the absence of pain in the two men whose clinical courses have just been described. One was a Christian Scientist, the other a man who hated to admit that anything was wrong with him. It is, however, well established that from time to time cases of coronary obstruction are observed in which pain is absent or insignificant. Perhaps this is largely due to individual indifference to pain; perhaps to a relative suppression of the appreciation of pain in the presence of an overwhelming anxiety produced by intense dyspnea. Perhaps the presence or the intensity of the pain may be dependent upon the state of the coronary vessels, especially upon the degree of the development of collateral circulation in the presence of diffuse sclerosis of the coronary circuit. Oberhelman and LeCount[6] showed that arteriosclerosis of the coronary circuit is accompanied in many instances by increased capacity of the collateral vessels. When this does not occur the occasion of a closure portends more rapid and complete degeneration of the muscular area involved; when the collaterals are well-developed, the shock of a single occlusion is less pronounced.

The typical attack of coronary occlusion is usually quickly recognized, but there are many instances in which the diagnosis is difficult because of the comparative mildness of the symptoms. It is quite generally assumed that the milder attacks are the result of occlusion in smaller vessels of the coronary circuit. The mild attack may be a precursor of an attack of major significance.

In his original paper Herrick recognized a group in which may be placed non-fatal cases with mild symptoms. Wearn[7] says, "A third group of individuals recover, become ambulatory and are able to return to light work." Such cases are likely to be characterized by cardiac pain so severe and persistent as to make untenable the diagnosis of a simple anginal attack, yet unassociated with the expected general symptoms of coronary occlusion. The diagnosis of occlusion is made more probable if fever and leukocytosis are present, and further strengthened if a pericardial rub is heard. The electrocardiogram may confirm the diagnosis, but should not be accepted as final evidence against it. The failure of a supposed attack of angina pectoris to respond to vasodilators, and the persistence of fairly severe pain for an hour or two in spite of the use of these drugs is, at least, highly suggestive. H. J. Stewart[8] says: "The minimum signs and symptoms upon which one may venture to make a diagnosis of coronary occlusion and to give and estimate the state of the coronary vessels and of the heart muscles are not known." When pain of this equivocal type follows a history of abdominal distress, suggestive of disease of the gall-bladder or stomach, the history, carefully developed, will often permit a correct diagnosis. The blood pressure, the condition of the peripheral vessels, the occupation and the physical constitution of the patient and the family history are factors of importance.

One feature of the symptomatology of coronary occlusion is the tendency to progression in many cases. This was illustrated in the case of an obese man of 55, who was wakened about 1:00 A. M. with characteristic pain. Some three hours later his physician was called and the administration of morphine gave relief. Early in the afternoon another attack was promptly controlled in the same way. About 7:00 A. M. the next morning an attack of great severity began with collapse, which required a larger dosage of morphine for control. Thereafter the patient made an uninterrupted recovery. Apparently a thrombosis beginning in a small vessel may be responsible for a similar process in a large vessel from which the first vessel derives, and the process finally involves an even larger branch. This sequence has been frequent enough in my experience to convince me that apparently minoor attacks cannot be too carefully and rigidly taken care of.

The diagnosis of the typical case is based upon the symptoms and physical findings described and the confirmatory evidence of the electrocardiogram. The differential diagnosis demands consideration of many thoracic and abdominal conditions; left-sided pneumonia or pleurisy, massive collapse of the lung, spontaneous

pneumothorax, pulmonary infarction, interstitial emphysema, acute pericarditis of infectious origin, acute intercostal neuritis (for instance, a herpes zoster of the left side prior to the appearance of the vesicles), dissecting aneurysm of the aorta, rupture of the heart, of a valve or of a papillary muscle—in short, any pathologic process of the thoracic wall or within it, which is associated with pain of great intensity, with dyspnea, cyanosis, tachycardia and shock, must be excluded.

In his original paper Herrick says:

"Emphasis ought to be laid on the resemblance of some of these cases to surgical accidents. The sudden onset with pain over the lower sternal and epigastric region, the nausea and vomiting, the tympany, the feeble pulse, ashy color, cold sweat, and other signs of collapse, make one think of such conditions as gallbladder disease, acute hemorrhagic pancreatitis, perforation of gastric or duodenal ulcers, hemorrhage into the adrenal capsule, tc."

In 1918, Levine and Tranter[9] published two cases calling attention to the importance of this phase of the differential diagnosis. In 1923, Wearn wrote: "The abdominal examination is an important one, for it is here that one is frequently misled in attempting to make a diagnosis." Levine,[10] in his recent monograph, summarizes the important differential signs thus: "It may be the marked muffling of the heart sounds, or the presence of a gallop rhythm, an alternating pulse, a pericardial friction sound, or a previous history of 'indigestion' on effort that will direct the attention of the physician to the coronary arteries. In fact, minor considerations like the family history or the general vigorous physique of the individual might be helpful in diagnosis. . . . At times changes occur in the electrocardiograms that are so characteristic that no other data whatever would be necessary to make a positive diagnosis."

In the diagnosis of coronary occlusion the electrocardiogram has become important. F. M. Smith[11] published the results of his experimental work in 1918. In 1919, Herrick discussed his results. In the course of this discussion he wrote: "There seems to be a fairly constant variation in the electrocardiogram following the ligation of a particular branch of the coronary." In 1920, Pardee[13] described the alteration of the R-S-T complex which is commonly known as the Pardee wave, and is regarded as diagnostic of coronary occlusion. The summary of his paper includes this paragraph: "The characteristic changes appearing a day or two after the obstruction are as follows: The Q-R-S group is usually notched in at least two leads and usually shows left ventricular preponderance. The T-wave does not start from the zero level of the record in either Lead I or Lead III, though perhaps from a line not far removed from it, and in this lead quickly turns away from its starting point in a sharp curve, without the short straight stretch which is so evident in normal records preceding the peak of the T-wave. The T-wave is usually of larger size than customary and accordingly shows a somewhat sharper peak. The T-wave is usually turned downward in Lead II and in one other lead. Not all of these changes are to be found in every record, but enough of them are present to give it a characteristic appearance."

Pardee[14] also directed attention to "the occurrence of records showing left axis deviation of Q-R-S or a normal electrical axis, combined with a large Q-wave in Lead III, one that is 25 per cent. or more of the largest deflection of Q-R-S in whichever lead this may occur. The majority of such leads are obtained from patients with the anginal syndrome, but certain patients with myocardial fibrosis and congestive failure, certain patients with rheumatic heart disease, especially with pericarditis, and a few with hypertension, will give such records." Fenichel and Kugell[15] believe that the large Q-wave is the most frequent electrocardiographic sign of coronary artery disease during the chronic period.

Fowler, Rathe, and Fred M. Smith,[16] upon the basis of experimental studies, state that "The occlusion of small branches of both the right and left coronary arteries and also the opening of the pericardium without the closure of a vessel produced successive changes in the T-wave of the electrocardiogram. In each instance the alteration of the T-deflection was associated with a lesion of the myocardium. We believe that electrocardiographic changes of this character are indicative of a myocardial lesion, and feel that these findings may be helpful in the diagnosis of occlusion of the smaller branches of the coronary arteries in man." The fourth lead has been studied by Katz and Kissin,[17] who describe three types of changes as specific for recent coronary occlusion, and by Wolferth and Wood, who state

that the "employment of chest leads adds materially to the usefulness of the electrocardiograph in the study of certain cases of myocardial infarction." Master[18] reports changes in the P-wave in 80 per cent. of 40 cases of coronary occlusion. "These changes consisted for the most part in increase in amplitude of the P-wave and occasionally in notching or widening of the auricular complex."

In summary, it may be said that the T-wave changes described by Pardee are generally accepted as indicative of acute coronary obstruction. The prolongation of the Q-wave as described by the authors just mentioned is frequently found in association with myocardial infarction, but is also found in other conditions characterized by marked myocardial changes. The changes in Lead IV are not yet established as characteristic. The electrocardiogram may also give us valuable information as to the nature of cardiac irregularities and tachycardia and may prove the presence of heart block, all of which alterations of rhythm often occur subsequent to cardiac infarction.

2306 Ridge Avenue.

BIBLIOGRAPHY

1. Herrick, James B.: J. A. M. A., 59: 2015, 1912.
2. Allbutt: Diseases of the Arteries, 2: 452.
3. Obrastzow u. Straschesko: Zeitschrift f. klin. Med., 71: 116, 1910.
4. Herrick, James B.: Amer. Heart Jour., 4: 638, 1929.
5. Davis, N. S.: Med. Clinics of North America, 16: 314, 1932-33.
6. Oberhelman and LeCount: J. A. M. A., 82: 1321, 1924.
7. Wearn, Joseph T.: Amer. Jour. Med. Sc., 165: 250, 1923.
8. Stewart, Harold J.: Amer. Heart Jour., 4: 394, 1929.
9. Levine, S. A., and Tranter, C. L.: Amer. Jour. Med. Sc., 155: 57-66, 1918.
10. Levine, S. A.: Coronary Thrombosis, Williams and Wilkins, Baltimore, 1929, p. 28.
11. Smith, F. M.: Arch. Int. Med., 22: 8, 1918.
12. Herrick, James B.: J. A. M. A., 72: 387, 1919.
13. Pardee, H. E. B.: Arch. Int. Med., 26: 246, 1920.
14. Pardee, H. E. B.: Arch. Int. Med., 46: 470, 1930.
15. Fenichel and Kugell: Amer. Heart Jour., 7: 235, 1931.
16. Fowler, Rathe, and Fred M. Smith: Amer. Heart Jour., 8: 370, 1933.
17. Katz and Kissin: Amer. Heart Jour., 8: 595, 1933.
18. Master, A. M.: Amer. Heart Jour., 8: 462, 1933.

THE CAUSES OF ACUTE DILATATION OF THE STOMACH

DIETRICH KLEMPTNER, M.D.

CHICAGO

A good deal of work has been done in the hundred years that acute dilatation of the stomach has been known to clear up the pathogenesis. Rokitansky suggested over 70 years ago the occlusion of the transverse portion of the duodenum for the explanation of the pathogenesis. Pathologists have been generally skeptical, many surgeons and physiologists have endorsed the theory. Real progress has been made in the understanding of the constitutional and metabolic changes that make up the late stages of the clinical picture. But duodenal obstruction, in one way or another, is the backbone of the many theories advanced, up to the present day, to account for the pathogenesis of the syndrome. Little attention has been paid to the dynamic nature of the forces that are responsible for acute dilatation of the stomach and to the fact that the acute dilatation is commonly the result of medical tampering with a protective mechanism of the body.

Present day theory—The most common present day conception of the pathogenesis advances a primary atony of the upper intestinal tract. The vagal branches act as the motor nerves of the stomach; their stimulation causes contraction of the muscular coat and relaxation of the sphincters. But severing the vagal branches does not cause complete atony of the stomach, because of the automaticity inherent in the muscles of the intestinal tract. A paralysis of the muscles must be postulated before the loss of tonus can occur.

It is assumed that strong somatic or visceral sensory stimuli which may be due to trauma or to handling of the viscera in the course of an operation cause inhibition of the vagal branches and paralysis of the muscular coat of the upper intestinal tract. The stomach gets distended and, by some mechanism or other, occludes the third portion of the duodenum.

The contents of the stomach are gas or fluids. The gas is mainly swallowed air of expiration (McIver, Lee). The fluids are made up of the various digestive juices of the upper intestinal tract: gastric, duodenal, pancreatic, bile, saliva. The fluids that accumulate in the stomach are arrested by the duodenal occlusion from passing down the bowels.

The average man secretes 6 to 8 liters of digestive juices in 24 hours. As a result of proteolytic action, histamin like bodies are formed in the duodenum and absorbed, and these substances powerfully stimulate the secretion of the digestive glands (Ivy, Dragstedt).

There is present, therefore, an abundant sup-

ply of fluids to explain the enormous quantities that keep on collecting in the stomach.

The water and salts are lost to the body. Water and salts are not absorbed in the upper intestinal tract, as has been proved by animal experiments.

The loss of water and salts produces the chain of the late events of syndrome: dehydration, demineralization, azotemia, alkalosis, myocardial insufficiency and death.

But why does the stomach get distended in the first place? What are the forces that carry gas or fluids into the stomach in quantities sufficient to produce the enormous dilatation? No adequate answer has been given.

Pathogenesis. Owing to differences in etiology and mechanism, all cases of acute dilatation fall into two groups. The first group occurs during surgical operations and the stomach is distended by air—acute operative dilatation. The second group occurs in the post-operative state or in association with certain medical diseases and the stomach gets distended by digestive juices: it may be called acute secretory dilatation.

Acute Operative Dilatation. There are some symptoms that are commonly mentioned in the history of cases recorded in the literature: the patients take the anesthetic poorly; their color is often bad; they come out of the anesthesia, they struggle.

Alvarez (1928) records several cases that occurred in animals while he was working with them with their bellies open. He noticed a peculiar type of powerful respiratory movement which rapidly filled the stomach with air.

Numerous mild attacks of acute dilatation which I experienced personally called my attention to the mechanism involved. I have been swimming for years, but poorly. Once a swimming instructor watched me and gave me points regarding the proper way of breathing while swimming. While carrying out his instructions and exhaling under water, I felt extremely distended after swimming a few hundred feet. Air bubbles kept on coming up and I was not conscious of swallowing air, but I became decidedly conscious of the severe distention caused by the swallowed air.

The common factor in all these cases of acute operative dilatation is a disturbed respiratory mechanism. Normal breathing is purposeful, efficient. The proper muscles are brought into play, rate and depth of respiration are adjusted to make the best use of the oxygen in the air. The introduction of unusual, difficult environmental conditions upsets the nice balance of the respiratory mechanism.

In my personal experience, the difficulty lay with breathing out under water. The expiratory phase of respiration became embarrassed. Obviously, the pharyngeal and esophageal muscles joined forces with the muscles of expiration and began to pump part of the unexpired air, to no good purpose, down into the stomach. It took me, by the way, quite a while to train these muscles not to trespass on the respiratory mechanism.

The patient who breathes in air mixed with vapors of ether or chloroform feels like choking, unless the anesthesia is deep. He struggles, but cannot escape his tormentor, the anesthetic. His respiration becomes difficult and disorganized, extraneous muscles come into play, and, whatever else happens, in some cases the muscles of deglutition begin to work synchronously with the expiratory muscles and force air down into the stomach, until the pressure there is in excess of the atmospheric.

The swallowing of air that distends the stomach and brings on the syndrome is, therefore, not a simple reflex act. It is a biological reaction, the expression of a struggle for adjustment to abnormal environmental conditions.

Inhalation anesthesia is the common etiological factor.

Acute Secretory Dilatation. The following case that I saw several years ago with Dr. S. Boros may help to throw light on the pathogenesis of this form. Only the facts pertinent to the problem on hand are given.

Case. J. D., female, 46 years old, single. She became sick with severe and copious vomiting and was given morphine sulphate and cocaine by mouth in dosage sufficient to stop the vomiting. Shortly thereafter she began to complain of feeling of substernal pressure that gradually gave away to agonizing pain all over the abdomen. There was a stoppage of stool and flatus. Enemata gave no result. She felt weak and thirsty.

Two years previous her appendix had been removed. For several years she had suffered from diabetes.

On examination she looked ill. The face was pinched, the nostrils were dilating. Temperature, 102; pulse, 130. She was emaciated, the skin atrophic, dry. There was no odor of acetone to her breath. The abdomen was symmetrically distended and tender all over. No peristaltic noises could be heard.

Later, at a hospital, the urine was found loaded with albumin, casts, sugar, acetone and diacetic acid.

She was operated on and a dilated stomach was found filled with characteristic fluid. After a stormy convalescence she eventually recovered. Diagnosis: Acute dilatation of the stomach, secondary to diabetic acidosis.

This case clearly presents the two factors that are essential for the production of acute secretory dilatation of the stomach: reverse peristalsis and suppression of the act of vomiting.

Reverse Peristalsis. The contents of the intestinal tract move caudad because of the arrangement of graded forces along the wall of the intestinal tract (theory of intestinal gradients of Alvarez). The wall of the upper tract possesses a higher tonicity, rhythmicity, metabolic rate compared to that of the lower bowel. The stomach acts as the "chief motor" of the system.

As a result of pathological conditions, a rearrangement of areas of high and low pressure may take place. The lower bowel may develop areas of increased tonicity through congestion, irritation; the stomach may become atonic. The intestinal gradient becomes flattened or reversed, and intestinal contents are carried by antiperistaltic waves to the stomach.

Reverse peristalsis expresses itself clinically by nausea, vomiting and a few more of the so-called dyspeptic signs.

Reverse Peristalsis and Acute Dilatation. Acute dilatation of the stomach is preceded by nausea and vomiting, the signs of a reversed gradient and peristalsis. The reversal of gradient is mechanically directly related to the atony of the upper intestinal tract, advanced and stressed by physiologists and clinicians as the result of the reflex inhibition of the vagal branches or the stimulation of the splanchnic nerves. The antiperistaltic waves carry fluids from the intestines to the stomach. If the stomach, for some reason, fails to empty itself by vomiting, it becomes distended. Next, the distention of the stomach reacts upon the motor and secretory functions of the digestive tract.

The low tonus of the upper intestinal tract, an important factor for the reversal of the intestinal gradient, is still further depressed by the distention of the stomach; the reversed intestinal gradient is steepened and the stomach is turned into an aspirating apparatus for the digestive juices and the contents of the small bowel. It may be possible and of interest to prove in the laboratory the regurgitation of fluids past the "occluded" duodenum.

The reverse peristalsis causes the stomach to get distended and the distention intensifies the reverse peristalsis: a vicious circle is created.

Thus the distended stomach acts as a dynamic barrier to the passage of the contents along the natural channels.

If the contents of the stomach are aspirated, the stomach is given a chance to contract and to regain the normal tonus, the normal intestinal gradient is reestablished and the syndrome is over.

The distention of the stomach stimulates the secretion of the digestive juices: first, that of the gastric juice, by direct mechanical irritation, as has been proved repeatedly by animal experiments (Ivy, 1925); second, that of the digestive glands of the upper intestinal tract by the formation and absorption of the secretagogues, referred to above. These toxins form as a result of stagnation in the upper intestinal tract, no matter how the mechanism of the latter is explained, and are absorbed owing to pathological changes that take place in the thinned duodenal wall. Thus the source of the large quantities of fluid in the stomach is explained. Next follow the loss of water and electrolytes, dehydration, toxemia and collapse.

Associated Pathological Conditions. Reverse peristalsis is associated with a vast number of pathological conditions. To mention some: exogenous poisons, including ether, chloroform, nitrous oxide; various forms of toxemia, as uremia, acidosis, eclampsia; endocrine disorders, infectious fevers; diseases of the intestinal tract, the peritoneum, the abdominal glands; diseases of the heart, the bronchi, lungs and kidneys; cerebro-spinal affections; migraine, tabetic crises, pregnancy, shock.

A striking coincidence stands revealed: any and all of the vast number and variety of pathological conditions that are associated with reverse peristalsis also act as exciting etiological factors of acute dilatation of the stomach. Thus, acute dilatation of the stomach and reverse peristalsis are linked together by definite clinical experience.

Duodenal Obstruction and Acute Dilatation of the Stomach. Duodenal obstruction is not a part of the pathological findings of acute dilatation of the stomach. At most, a few observers have noted a slight groove where the arteriomesenteric attachment is supposed to compress the duodenum against the spine. On lifting up

the bulky stomach, the contents rush down into the intestines.

Definite duodenal obstruction does not produce the syndrome, either in the clinic or in the laboratory. Light obstruction, for instance, the kind produced by placing a thin rubber band around the third portion of the duodenum, an obstruction that can be overcome by a column of water ten to fifteen centimeters high, may lead to the development of the syndrome. It is obvious that it is not the occlusion that matters. The essential factor is the irritation set up in the duodenal wall by the pinching of the rubber band. An area of increased tonicity is produced, the upper intestinal gradient is reversed, the digestive juices are backed up into the stomach, and all the associated phenomena follow.

The same mechanism may be uncovered in the clinical cases recorded as conclusive proof of the presence of secondary occlusion of the duodenum. As an example let us take the interesting case of Dragstedt (1931).

Excerpts from case. A robust man as a result of a trauma to the abdomen had to have twelve feet of the lower jejunum and upper ileum resected. The jejunum was brought to the abdominal wall as a fistula. The patient thus had a functioning alimentary tract consisting of the stomach, duodenum and about six feet of jejunum. For the first 48 hours there was profuse drainage from the jejumostomy opening. This suddenly ceased on the third day, and examination revealed a dilated stomach containing about 1,400 cubic centimeters of characteristic fluid. Aspiration of this fluid relieved the patient greatly, and shortly thereafter the drainage from the jejunostomy opening again became profuse.

The author concludes that the aspiration of the stomach contents relieved the compression of the duodenum by the distended stomach. He does not explain why the drainage from the fistula stopped in the first place and why the stomach got distended.

The stoppage of drainage and the dilatation of the stomach are obviously due to reverse peristalsis. And reverse peristalsis is known to be a common occurrence in the presence of a jejunal fistula of this kind. As a result of the aspiration, the stomach regained its tonus, normal peristalsis was reestablished and the patient was greatly relieved. The alternating change in the direction of the intestinal gradient was responsible both for the production as well as for the relief of the syndrome.

Suppression of Vomiting. Vomiting is a complex act. It is made up of voluntary and involuntary components, the former dominating in power. During the act, the cardia and fundus relax; contraction of the abdominal muscles, the diaphragm and the antral portion of the stomach forces the contents up into the esophagus, and from there a sudden expiratory movement carries them out over the closed rima glottidis.

The act of vomiting is not merely a measure of defense and protection against exogenous poisons; it is of a distinctly protective nature for the integrity of the stomach itself, even in those pathological conditions in which it is merely an associated reflex movement, the result of accidental stimulation of the vomiting center.

As long as the stomach can empty itself by vomiting, it does not get distended. If vomiting is suppressed or inefficient and some degree of atony is present, the stomach is helpless against the rush of fluids carried there by reverse peristaltic waves, and dilatation takes place.

Etiology. Suppression of vomiting may be due to extreme debility. Enfeebled patients, prone on their back, may lack vitality to clear the stomach. But few cases come under this head. Patients may die from various causes, though not of acute dilatation, and the very last breath they exhale may be associated with strong and copious vomiting.

In conditions where vomiting is very painful, as in pneumonia, fractures, operative wounds of the upper abdomen, patients try to suppress the act. A few possibly succeed. Suppression of vomiting is more common in the very toxic patient, when the vomiting center is depressed.

A body cast may interfere with vomiting.

Vomiting is commonly suppressed by the use of palliative drugs in the course of medical treatment. Nausea and vomiting belong to the most unpleasant experiences that "the flesh is heir to." The patient demands relief. Palliative treatment is not always the best, but it is the easiest. Many a case of acute dilatation of the stomach is directly the result of this sort of medication.

Opiates are indispensable for the relief of pain in the post-operative state. Due to the effect of the anesthetic or to the pathological state under treatment, reverse peristalsis is commonly present in the post-operative state. Reverse peristalsis and opiates are a combination that produces acute dilatation of the stomach. It is not surprising that from 60 to 70 per cent. of the cases occur in the post-operative state.

Prophylaxis. The syndrome is often the result of medical ministration and, as such, should be eliminated. Whenever sedatives or opiates are used or local anesthetics taken orally and the pathological condition present may be associated with atony of the stomach or reverse peristalsis, the soil is ripe for the development of the syndrome. Watch must be kept for the appearance of the earliest signs of distention and trouble averted by the prompt use of the stomach tube and aspiration.

SUMMARY

1. There are two forms of the syndrome: acute operative dilatation, when the stomach is distended by air, and acute secretory dilatation, when the contents are mainly fluid.

2. Acute operative dilatation is the result of a respiratory mechanism disorganized by unusual, difficult environmental conditions.

3. Associated swallowing movements are initiated that are synchronous with the expiratory movements. Expired air is forced into the stomach and distends the latter.

4. Inhalation anesthesia is the common etiological factor.

5. Acute secretory dilatation is the product of two factors: reverse peristalsis and suppression or inefficiency of the vomiting act.

6. Reverse peristaltic waves carry fluids that distend the stomach, if vomiting is suppressed or inefficient.

7. Due to the distention, the stomach loses its tonus, the reverse intestinal gradient gets steeper and the stomach becomes a dynamic barrier to the passage of the contents along normal channels.

8. Water and minerals are lost to the body and the characteristic metabolic and blood changes make their appearance. If the contents are aspirated, the stomach regains its tonus, normal peristalsis is reestablished and the syndrome is relieved.

9. Duodenal obstruction is not a part of the pathology of acute dilatation of the stomach; it provides no adequate explanation of the pathogenesis and needs not be postulated.

10. Many a case of acute dilatation is the direct result of palliative treatment of nausea and vomiting.

11. Reverse peristalsis and opiates meet most commonly in the post-operative state. The majority of cases of the syndrome occur in the post-operative state.

12. The stomach tube and aspiration should be used at the earliest signs of distention, whenever vomiting has been arrested and reverse peristalsis persists.

5026 N. Troy Street.

LITERATURE

1. Alvarez, Walter C.: The mechanics of the digestive tract, 1928.

2. Dragstedt, L. R., et al.: Pathogenesis of acute dilatation of the stomach. Surg., Gyn. Obst., **52**: 1075-1086, 1931.

3. Lee, B. J.: Acute dilatation of the stomach. Annals of Surg., **63**: 418-437, 1916.

4. Kellogg, E. L.: Acute dilatation of the stomach. Amer. J. of Surg., **13**: 227-234, 1931.

5. Starry, L. J.: Acute gastric dilatation. J. Oklahoma M. A., **22**: 209-210, 1929.

THE SERVICE PROGRAM OF AMERICAN LEGION

PAUL G. ARMSTRONG

Commander of the Department of Illinois, American Legion

CHICAGO

Mr. Chairman, Dr. Cary, Distinguished Gentlemen of the Medical Profession: I am indeed happy to be here tonight at this splendid dinner and to have the privilege of presenting to you men some of the ideals and principles of the organization that I have the honor to represent.

For several years, as Dr. Cary has stated, there was considerable misunderstanding between the American Legion and the medical profession. I believe that a portion of that misunderstanding might rightfully be placed on the doorsteps of the members of your profession who were eligible for this organization and who in the communities where the American Legion has met, have not taken an interest in or in many instances have not entered into the activities of that organization or tried to advise them along the lines upon which, it is very *apparent,* that we needed advice. Any mistakes that this organization has made in the past have been mistakes of the mind and not mistakes of the heart. We have tried to care for the men who were disabled in the war. Some years ago we recognized that in the department of Illinois there was some misunderstanding between the medical profession and the American Legion. The reason for the difference

Veterans' Service Committee Dinner, Eighty-fifth Annual Meeting, Illinois State Medical Society, Rockford, May 21, 1935.

of opinion was recognized by certain members of your profession who were valuable members of our organization. For many years men were appointed department surgeon who used only the title and meant nothing to the Legion other than to be recognized as department surgeons of the American Legion. Finally there were appointed to this post individuals who were interested not only in the American Legion but in the medical profession as well. Under their leadership and by their gathering the surgeons and physicians of this great state into an organization inside of the American Legion, if you please, they tried to bring about a better understanding between the two, and they have succeeded in so doing. I want to pay tribute here tonight to some of those individuals. I do not know that I repeat their names in the order in which they served. Our chairman here tonight, Dr. Fredrickson, is to blame for a great deal of the new understanding we have. Dr. Garm Norbury, Dr. Tom Williamson, and now Dr. Elmer Moseley helped to carry on the work, and to carry things just a little further. One of the most important, perhaps the most important activities we have in the Department of Illinois, is the care of children, and we have a distinguished member of your organization as Chairman of the Child Welfare Commission, Dr. Charles Schott. He has made an outstanding contribution to child welfare in this state and, in fact, in the national organization of the American Legion. I assure you gentlemen of the medical profession here tonight that so far as I know there is no intention on the part of this organization to extend the privilege of hospitalization to men who are able to pay for that hospitalization. I am sure, as Dr. Cary said a few moments ago, that he expressed the opinion of the majority of the leaders and members of our organization when he said that there was no intention in the mind of our national leaders to extend the privilege of hospitalization in government hospitals to those who are able to pay their way. They have cooperated in putting in a pledge or oath that men taking or receiving that assistance are unable to pay for the medical attention they receive. It is true in this case as in every other case that there are bound to be men who will sign any kind of oath to get something for nothing. We have been trying to cooperate to the best of our ability with the program of this medical association. I would suggest—carrying out the thought of Dr. Moseley—that you men in your communities take an interest in the affairs of the Legion post. You men are capable of directing the Post organization along the lines that it should be directed. We welcome you into our organization and we welcome your cooperation in our program.

We have been trying for this year in this great state of Illinois and in this Department to be of help to all the citizens of the community and to practice the ideal of this organization. We are interested in these communities. We are interested in building up the community, not in tearing down any portion of the community. We are interested particularly in the next generation. I wonder if you will bear with me for just a few moments while I talk to you about a thing which has been very near my heart during the past year, something that we have been trying to put into the fight to save some of the children of this next generation, the problem of juvenile delinquency.

I learned a few weeks ago that juvenile delinquency was on the increase in this state, that it is in every community. I learned that the cure we are trying to give them in the institutions of this state was not working. I learned from one source that 300 boys from Cook County and 300 from outside had left the institution at St. Charles. They were able to trace 270 in each instance and they found that 88 per cent. of the boys from Cook County and 45 per cent. from downstate had graduated into institutions of higher learning, Stateville, Pontiac, and other penal institutions.

We have heard a great deal about communism. It is a menace to this nation today, but in my estimation the greatest menace to the future of America with its fine American youth is juvenile delinquency. Thousands of boys are graduating from high schools and colleges with no place to be absorbed in industry. I have received some figures from Washington which have a bearing not only on communism but on juvenile delinquency. The government recently announced that there were 12 million heads of families in the United States unemployed. D. W. McCormick, Director of Immigration, in reply to a question propounded by Congressman Blanton of Texas, said there were over 16,000,000 aliens in America; three and one-half million illegally.

I only have to refer to one name, Bruno Richard Hauptmann, to prove the danger of these aliens who are within our borders illegally. Four and one-half million of those aliens are on the relief rolls of the United States. All of these figures contribute to the increasing juvenile delinquency that exists, because it is estimated there are 4 million aliens employed in the United States, and when our boys graduate from high schools and colleges there is no place in industry into which they can be absorbed. Many are easily drawn to a life of crime, because an idle mind, as has been frequently said, is the "Devil's workshop."

This is a serious question. Recently Congressman Blanton said there was no country on the face of the globe that would permit aliens on relief to stay in the country except the United States of America. However, when they tried to return the aliens at a cost of about a month and a half of actual relief which the country was giving, somebody in Washington stopped that program, although by shipping them back at cost of one and one-half months' relief they would have entirely eliminated them from the relief rolls of the United States. The organization to which I belong has always had a strong immigration policy. I believe when we get through with our St. Louis convention, we will have a stronger immigration program as well as a strong naturalization program, that after they have been here for a certain number of years accepting the privileges and benefits of this great government, if they are not willing to accept the responsibilities of citizenship they can return to the land from which they came. (Applause.)

The time that was allotted to me is now up, but I want to assure you members of the medical profession that this organization of the American Legion dedicated for God and country, is in your several communities ready to serve that community and we are ready to cooperate with you. We ask only that you give every consideration to the program that we present, and where you find that it does not entirely agree with the program of your organization let us try to get together and iron out our differences. We are ready, willing and anxious to cooperate with members of this great splendid profession.

I am happy to have had this privilege and I thank you very much for your kind attention.

127 N. Dearborn Street.

CARDIAC REVIEW OF 1934

NATHAN FLAXMAN, M. D.
CHICAGO

General Remarks: Riesman and Harris[1] stated that whether there is or there is not an "alarming increase" in deaths from organic heart disease, the fact is that heart disease stands at the head of the list. This makes it a definite problem in health conservation in the sense that efforts should be made to postpone as late as possible death from heart disease. Brooks[2] emphasized that the main asset in the care of patients with organic heart disease is optimism. Stone[3] stated that regardless of how one feels about the alleged increase in the number of deaths assigned to cardiac causes, there can be no real difference of opinion as to the importance of heart disease as the foremost cause of death. Bierring[4] advised that it is of the utmost importance that the patient accept the view that the aging process is a physiologic change and does not permit the same activities as in younger years. Brooks[5] pointed out that in the treatment of the failing heart, we must treat the patient as the whole and as an individual, not just the heart.

1. *Anatomy and Physiology:* Gross, Epstein and Kugel[6] described the age period changes that the coronary arteries and their branches undergo. The main coronary arteries thicken and stiffen with age. The myocardial arterioles show changes far less marked and the capillaries present very slight changes with age. Seecof, Linegar and Myers[7] presented chemical evidence that the left and right ventricles of the heart are different muscles. Coonse and Aufranc[8] demonstrated that rendering the intrapleural pressure more negative produces dilatation of the heart, a diminished rate of flow through the pulmonary circuit, a relative anoxemia, a slow pulse, an increased blood pressure, a fall in venous pressure, and a rise in body temperature. Bain[9] observed, by means of the histamine flush test, that the speed of circulation is slow in uncomplicated heart disease. Bohning and Plaut,[10] in 35 subjects with cardiac lesions, noted that in auricular fibrillation the total systole was definitely shorter and the total diastole definitely longer than in normal subjects. Richards and Barach,[11] from studies on 28 patients with cardiac insufficiency kept in 40-50% oxygen for continuous periods ranging from 7 days to 7 months, stated that the clinical indications for oxygen therapy in their relative order of importance are: dyspnea, restlessness, cardiac pain of the anginal type, arterial oxygen insaturation, cyanosis, and cough. Harrison, Friedman,

From the Dept. of Medicine, Loyola University School of Medicine, Chicago.
Received for publication, Jan. 26, 1935.

Clark and Resnik[12] reported that the output of the heart per beat tends to be less during congestive failure.

2. METHODS OF CARDIOVASCULAR EXAMINATION

1. *Auscultation:* Lendon [13] reported that from a clinical aspect there are four types of systolic apical murmurs. 1. Constant murmurs, constant from cycle to cycle and from day to day; these are harsher and longer murmurs and are heard over the precordium and out to the axilla; they are the ones which are chiefly regarded as signifying mitral regurgitation. 2. Inconstant murmurs, soft and blowing in character, and often heard in one posture only, the recumbent; these vary from time to time, vary with exercise, and are usually audible over a localized apical area. 3. Extracardial murmurs as the pericardial murmur are short, superficial and have a scraping sound. 4. Cardiorespiratory murmurs are the commonest apical murmurs and may extend to the left axilla. Sosman and Wosika[14] demonstrated the position of the heart valves and their relation to the anterior chest wall in living subjects with abnormal hearts. This was done by the roentgen ray study of calcified aortic and mitral valves. Great variations in the position of the mitral and aortic valves occur as the heart enlarges or otherwise changes its relations to the chest wall. They feel that this has an important bearing on the localization and distribution of murmurs and is of great significance in the interpretation of physical signs.

2. *Other Methods:* Griffith, Chamberlain and Kitchell[15] observed venous pressure in health and in disease as to the practical significance and stated that in cardiac failure, whether of primary or secondary origin, it is always elevated. They added that in the prognosis of cardiac failure, venous pressure determinations are valuable, as a rise above 200 mm. of water has an unfavorable prognostic significance. Sola[16] considered the rise in venous pressure of great importance in the early diagnosis of cardiac decompensation. Harrison[17] reported that the cerebrospinal fluid pressure is markedly elevated in patients with congestive heart failure and that this pressure usually runs closely parallel to the venous pressure when the patient is in the prone position. Friedfeld and Fishberg[18] recorded that elevated venous pressure due to failure of the right heart is accompanied by an increase in the cerebrospinal fluid tension, due mainly to the engorgement of the intracranial and intraspinal vessels and probably also to the edematous swelling of the nervous tissues and the meninges.

3. *Electrocardiography:* Steuer[19] analyzed 50 autopsied cases in which there had been electrocardiograms of low voltage during life, and noted that the most significant and most frequent pathological finding was coronary sclerosis in 76% of the cases. In the remaining 24% of the cases, acute or chronic infections were the most important factors. France[20] analyzed 103 electrocardiograms characterized by normal sinus rhythm with a significant Q wave in Lead 3 and stated that while this is sometimes present in the absence of heart disease, it is very frequently associated with serious myocardial damage. Shookhoff and Douglas[21] studied the Q deflection in normal and abnormal electrocardiograms and concluded that a large Q wave in Lead 3 is caused by a change in the relative position of the ventricular musculature, for which many causes may be responsible. Wallace[23] stated that of 108 cases showing a significant Q wave in Lead 3, angina pectoris was present in 50% of the patients, hypertension and arteriosclerotic heart disease in 33%. McGinn and White[23] studied the duration of the QRS complex of normal and abnormal electrocardiograms in 500 cases and suggested a more satisfactory method of describing the complex. Scherf[24] stressed the great independence of the shape of the terminal, the ST, deflection in the electrocardiogram, but added that it is wrong to base a prognosis as to the life expectancy on such changes. Easby and Roesler[25] noted that certain changes in the S-T segment of the electrocardiogram occur very frequently in acuate rheumatic fever. Feldman and Hill[26] stated, after a study of the electrocardiogram in pregnancy, that one should bear in mind that at a certain stage of pregnancy left axis deviation or a large Q wave in Lead 3 or both may be found, and that these disappear as soon as the uterus empties itself. Goldbloom[27] evaluated clinically the precordial lead or Lead 4 in ambulatory cases of coronary artery disease and in acute coronary occlusion; he advocated the use of this extra lead routinely after a study of 8 cases, after it proved positive in 7.5% of the cases of coronary sclerosis and in 30% of the cases of acute coronary occlusion. Wood and Wolferth[28] reported 7 cases of acute cardiac infarction which showed huge T-waves in Lead 4, and these large waves disappeared at a later date in all of the cases.

4. *X-Ray:* Bishop and Roesler[29] cited the frequency of post-mortem findings of calcification of the aortic and mitral valves. They reported 3 cases in which the roentgen observation of these calcifications in the living were confirmed by autopsy. It is their belief that the roentgenologist can play a leading role in the recognition of valvular calcifications which are more frequent than is realized. Steel[30] presented 6 cases of chronic cardiac aneurysms with silhouette studies. When the cardiac aneurysm was well developed, the roentgenologic method was the only means of positive diagnosis, especially in those cases in which a history was not available. Wosika and Sosman[31] demonstrated calcified coronary arteries in 3 patients who suffered from angina pectoris. Levene, Wheatley and Matthews,[32] in the roentgen diagnosis of coronary disease, depended upon the recognition of changes in the contour and function of the heart produced by the impairment of the myocardium. Spark and Evans[33] stated that calcification in the heart valves may be present as the nodular type described by Monckeberg, and the presence of a landmark within the heart was of assistance in giving anatomical significance to the radiographic findings. As both coronaries arise from the sinuses of Valsalva of the aortic valve, it may be possible to map out the usual distribution of the arteries and to localize small areas of calcification as being in the course of these vessels.

3. SYMPTOMS AND SIGNS

1. *Edema:* Thomson[34] recorded the results of an investigation of the plasma protein and cardiac edema, and noted a distinct diminution in cardiac edema as 87.5% of the cases having a plasma albumin content less than 3.2%. In organic heart disease without edema, there was only a slight decrease in the plasma proteins. Plasma protein deficiency has an important part in the etiology of cardiac edema. Malnutrition was considered to be the main cause of the depletion, and it was suggested that patients with cardiac edema be given the maximum amount of protein in a diet compatible with their digestive powers. Wassermann[35] asserted that acute cardiac pulmonary edema is produced by a cardiac-central reflex in the region of the pulmonary capillaries with the exudation of serum into the alveoli, so that there is grave danger of primary respiratory death or of secondary heart failure at the height of these attacks. Salmon[36] refers to the neurohormone theory of acute pulmonary edema, which he believes explains the relation of the condition to arterial hypertension. Because of the intimate relation, anatomically, between the sympathetic nervous system, the bulbar nuclei, the vagus center, the respiratory center, and the vasomotor nuclei, it gives rise to the vagotonic symptoms of bradycardia, fainting, polypnea, and dilatation of the pulmonary vessels, the most characteristic symptoms of acute pulmonary edema.

2. *Others:* Smith and Plunkett[37] reported 2 cases in which the symptoms of cardiac insufficiency were masked by those referable to the gastrointestinal tract, and concluded that these cases are often difficult to diagnose before the cardiac failure becomes pronounced or until they have received treatment for cardiac failure. Stein and Schwedel[38] noted interlobar effusions in patients with organic heart disease, and stated that these peculiar effusions were not roentgenological freaks but constituted a definite part in the history of chronic cardiac disease. Keefer and Mallory[39] summarized 22 cases of aortic aneurysm showing conspicuous pulmonary and pleural complications and reported that atelectasis, bronchopneumonia, organizing pneumonia, abscess or bronchiectasis, arose as the result of tracheal or bronchial compression or of direct invasion of the lung. Waring and Black[40] cited the clinical picture of dyspnea, cyanosis, and polycythemia, without evidence of valvular disease of the heart, suggesting the syndrome of obstruction in the lesser or pulmonary circulation. Criep[41] stated that the average length of life was only 14 months in cases showing definite symptoms and signs of cardiac asthma, based on a study of 21 cases. McGinn and White[42] reported 20 cases of mitral stenosis with attacks of acute pulmonary congestion with and without cardiac asthma; they explained that these symptoms and findings resulted when the heart was stimulated by greater work and the hypertrophied and dilated right ventricle propelled more blood into the pulmonary vessels than could pass through the stenosed mitral valve in the same unit of time. Harrison and his coworkers[43] made many observations on nocturnal dyspnea and cardiac asthma and added that the most common precipitating factor was cough, less frequently fear, abdominal distension, or warmth, each of these acting by precipitating a marked increase in the ventilation of the lungs. Cohm and Steele[44] investigated fever in a large number of cases of myocardial failure and stated that the fever was caused by mechanics involved in the heart insufficiency itself. King, Hitzig, and Fishberg[45] reported 3 cases of recurrent laryngeal paralysis in left ventricular failure and presented a suggestion that the cause of the paralysis may be regarded as dynamic dilatation of the pulmonary artery due to the engorgement of the lesser circulation. Urioste and Blanco[46] reported that the crises of sweating may occur as a clinical equivalent of angina pectoris and acute edema of the lungs; these sweating crises were abundant and generalized, or predominated in the anterior portion of the neck and chest, always accompanied by pallor, peripheral chilliness, tachycardia, and a sensation of distress or approaching death.

4. INCIDENCE OF HEART DISEASE

Perry[47] analyzed the cases of organic heart disease seen by the late Dr. Carey Coombs in the wards of the Bristol General Hospital during the years 1918 to 1929. Rheumatic fever was the etiological factor in over 55% Figures then were obtained for cardiac cases admitted to the various hospitals in Great Britain for 1932. Of 2,680 cases, the results were: congenital, 1.1%; rheumatic, 38.4%; ulcerative endocarditis, 2.3%; syphilitic, 6.5%; thyrotoxic, 10.7%; hyperpiesis, 12.7%; senile cardiosclerosis, 19.1%; functional, 3.8%; and various, 5.1%. Cohn and Lingg[48] indicated that the rise in the rate of circulatory disease depends largely on the rate in fall of the infectious diseases, not in early life but in the very decades in which a rise in the circulatory group has taken place. Bishop and Bishop[49] suggested that a better knowledge of coronary disease has been a large factor in initiating the studies that have placed emphasis on the heart. Arenberg[50] analyzed organic heart disease in male seamen and stated that it bears a similar relationship, from the standpoint of etiology, to that of the population at large with the exception of the greater incidence of the syphilitic group and a correspondingly lower incidence in the rheumatic and arteriosclerotic groups. Goodman and Prescott[51] examined 166,152 children between the ages of 14 to 17 years in New York City, and after extensive study, 528 (0.57%) were found to have organic heart disease. Flaxman[52] studied the incidence and etiology of 1646 cases of organic heart disease at the Cook County Hospital; the incidence was 1.7% of the hospital admissions and 7.2% of the medical admissions; 38% died in the hospital during this period; the common age was the 40 to 60 year period; most frequently in the sixth decade in the white patients and in the fifth decade in the colored patients. Hypertension was the most common cause regardless of race or sex; arteriosclerotic and rheumatic heart disease were more common in the white patients. Arteriosclerotic heart disease was five times as common in the white patients, and rheumatic heart disease was twice as frequent, while syphilitic heart disease was twice as common in the colored patients. Hypertensive, arteriosclerotic, rheu-

matic, and syphilitic heart disease accounted for 90% of the cases.

5. ETIOLOGY

1. *Congenital:* (a) *Septal Defects.* Roesler[53] reviewed 62 cases of interatrial septal defects and reported one case of his own; he noted that at least three-fourths of the cases also had valvular diseases which affected predominantly the mitral valve. Gross[54] investigated the patency of the so-called "anatomically open but functionally closed" foramen ovale and experimentally proved that under conditions of pressure preponderance in the right auricle over the left auricle, fluid and emboli may be transmitted from the right auricle through the foramen ovale into the left auricle; when the converse occurred, the valve-like action of the foramen prevented the transmission of pressure or fluid from the left to the right auricle. Halpert and Tennant[55] reported 2 cases of anomalies of the interventricular septum and the pulmonary orifice. Muir and Brown[56] observed 100 cases of congenital heart disease in school children and indicated that 40 had a patent interventricular septum because of the principal physical finding, a harsh prolonged systolic murmur of maximal intensity in the 3rd and the 4th left interspaces close to the left sternal margin. Favorite[57] reported a case of a three chambered heart, two auricles and one ventricle, with hypoplasia of the transposed aorta and a patent ductus arteriosus in an 18 year old white male, which terminated by rupture of a dilated pulmonary artery.

(b) *Congenital Complete Heart-Block:* Suzman and Campbell[58] gave an account of 8 cases and noted that this possibility should be remembered when treating children with a slow pulse; they reported that in spite of this abnormality the patients can and do lead an active life, surviving to adult life and longer. Yater, Leaman, and Cornell[59] reported a case studied by serial sections through the conduction system in which there was practically complete separation of the auricles and the ventricles by the central fibrous body where the specialized muscle body normally bridges the auriculo-ventricular groove.

(c) *Coarctation of the Aorta:* Grollman and Ferrigan[60] studied the cardiac output in this congenital anomaly and reported that the heart is capable of overcoming the anatomic defects by expelling the blood at a high pressure to supply the entire body provided an adequate collateral circulation is present. Stewart and Bellet[61] reported a case in a 26-year old white male in which sudden death resulted from a dissecting aneurysm with rupture of the aorta above the coarctation. Taylor[62] emphasized the radiological aspects of these cases especially where the clinical picture itself is not convincing. Pierce[63] described a typical case in a 30-year old white male who had a peculiar picture of decompensation and at autopsy an abscess of the mediastinum communicating with the thoracic portion of the aorta and esophagus was found. Other cases reported were those of Beatty[64] and Hardaway and Sawyer.[65] Brown[66] reported a case of a 30-year old female who had all the symptoms and findings of a coarctation of the aorta and developed a subacute bacterial endocarditis with a positive blood culture of streptococcus viridans.

2. *Rheumatic:* Hart, Wood and Daughton[67] noted that serious and permanent damage to the heart is evidenced in a surprisingly large number of persons with rheumatic fever in Piedmont, Virginia, as 138 or 69% of 200 cases of rheumatic fever had valvular heart disease. Small[68] advised that smaller doses of the aqueous extracts of the streptococcus cardioarthritidis be used in the treatment of rheumatic carditis, especially in those cases in which dangerous exacerbations of rheumatic fever occur. Paul, Salinger and Zinger[69] investigated the families of patients who had sustained an attack of postscarlatinal non-suppurative arthritis or carditis and noted a high incidence of the manifestations of rheumatic fever. Rothschild, Gugel and Gross[70] studied 161 hearts with evidence of rheumatic disease at some time; 106 showed evidence of active rheumatic infection; 103 of the 106 showed that the cause of death was heart failure, and they concluded that the majority of instances of heart failure in the first five decades of life in individuals who have a valvular defect can be attributed to an active infection of the myocardium rather than to the degree of the mechanical defect. Simons[71] reported 206 cases of rheumatic heart disease seen in the Louisville City Hospital and noted that the greatest number developed symptoms during the third and fourth decades of life and that 85% had shown some degree of decompensation before the 40th year of life. Easby[72] reported a case of subarachnoid hemorrhage in a 12-year old girl complicating rheumatic heart disease; the girl completely recovered from the coma without any residual neurologic symptoms. Friedberg and Gross[73] reported 4 autopsied cases of widespread periarteritis nodosa, so-called necrotizing arteritis, associated with rheumatic fever and rheumatic heart disease. Paul, Harrison, Salinger, and DeForest[74] studied the social incidence of rheumatic heart disease in 5758 public school children and noted that it was twice as frequent in pupils attending two urban public schools as it was among pupils of a similar age group who attended suburban and rural public schools. De La Chapelle, Greaf and Rottino[75] analyzed 119 consecutive rheumatic hearts obtained at autopsy in relation to the cardiac rhythm, and reported that the occurrence of auricular fibrillation had no relationship to the grade of mitral stenosis. Calvin and Nichamin[76] reported 2 cases of spontaneous rupture of the thoracic aorta in children and noted the definite relationship to rheumatic fever, as both had verrucous aortitis, and one showed a typical and the other suggestive findings of rheumatic myocarditis. Hawking[77] reported latent acute rheumatic carditis as noted at autopsy in 17 patients in whom the condition was not recognized during life, and concluded that in addition to those whose condition is diagnosed during life as rheumatic fever that 1.2% of other patients dying also had active rheumatic disease. Fraser[78] and Karsner and Bayless[79] demonstrated that rheumatic fever causes an irregularly distributed endarteritis of the coronary arteries. Willius and Smith[80] studied 79 cases of rheumatic heart disease at necropsy for the factors concerned in cardiac hypertrophy and concluded

that the increased work caused by the valvular defect was not the only cause of the hypertrophy, but other factors, as the length of time the heart was subjected to the lesion and the actual myocardial injury, exerted a definite but less important influence. Lisa and Chandlee[81] noted the clinical course in 6 cases of combined syphilitic and rheumatic heart disease; the course and the lesions were mainly rheumatic, and added that combined active infections have a much graver prognosis.

3. *Bacterial:* Held and Goldbloom[82] reported 4 cases of rapidly fatal acute streptococcus viridans endocarditis, all preceded by an acute infection of several days to several weeks duration; the reason why these cases had a rapidly fatal, instead of a protracted course, was that there occurred almost total loss of the reactive powers of the reticulo-endothelium of the endocardium. Ferguson, Murdock and Welch[83] described diptheroid appearing organisms recovered repeatedly from blood cultures during life in 2 cases of subacute bacterial endocarditis. Further bacteriological studies after autopsy showed that the streptococcus existed in two phases, a typical streptococcus phase and a diphtheroid phase; this was of etiologic value as the organism, isolated from blood cultures in the diphtheroid phase, changed under suitable conditions into the green producing streptococcus. Eakin[84] reported two cases of gonococcic endocarditis, one in a 29-year old male who developed chills and fever five months after the urethritis and expired in 6 weeks of aortic endocarditis; the other in a 32-year old female with multiple arthritis who developed the endocarditis 2 weeks later. Peters and Horn[85] reported two proven cases of malignant ulcerative gonococcic endocarditis, both fatal 5 days after the first evidence of the endocarditis. Israel[86] described a case of *Salmonella suipestifer* bacteremia with acute endocarditis in which the four-year old boy recovered and the murmurs over the cardiac area disappeared. Goldstein[87] reported a case of a 21-year old Italian female with classical signs of mitral stenosis and a severe acute arthritis who developed chills, fever and a leucocytosis; gram negative diplococci of the Neisseria pharyngis group were recovered from the blood stream in pure culture. Weiss[88] studied the relation of the portals of entry to subacute bacterial endocarditis in 364 cases and concluded that the streptococcus enters most frequently from foci of infection in the mouth and upper respiratory tract. He reported ten cases in which a history of tonsillectomy or tooth extraction closely preceded the onset of symptoms, and added that trauma about the teeth and pharynx produces a bacteremia which in the presence of previous cardiac disease causes a bacterial endocarditis. Dimitracioff[89] treated four cases of endocarditis lenta with autogenous vaccines; of the four, three are still alive, 2, 3, and 1½ years after recovery, and he urged that in spite of the many reported failures this method should be given further trial.

4. *Syphilitic:* Conner [90] reviewed the development of the entire subject from the earliest times and questioned whether the most has been made of the knowledge concerning this preventable cause of heart disease. Cooley and McNamara[91] reported a case of syphilitic aortitis with an aneurysm of the innominate artery and occlusion of the left common carotid artery in which the patient had the symptoms of dizziness, retarded mental reactions, and the sensation of smothering when lying down on the left side because of the unusual blood supply. Musser[92] advised, in syphilitic aortitis, a heavy course of metals and potassium iodide for 2 or 3 months before arsphenamine is given, to be later alternated with bismuth. In dilatation of the aorta and aneurysm, a minimum amount of treatment should be given in the early stages. In the treatment of syphilitic valvular disease without failure, large doses of potassium iodide should be given daily and with it, bismuth salicylate 0.2 gm. weekly for 3 months; then to give 0.1 gm. of neoarsphenamine once weekly for three months. In the treatment of syphilitic valvular disease with heart failure, treatment of the myocardial insufficiency is the first indication, and under no circumstances should neoarsphenamine be given as long as the patient is in a state of failure. Budnett and Rymer[93] in this country and Healey[94] in England emphasized the close relationship between neurosyphilis and cardiovascular syphilis. Sager and Sohval[95] histologically proved that combined syphilitic and rheumatic disease of the aortic valve does occur. Bruenn[96] analyzed 118 cases of cardiovascular syphilis and compared cases with coronary involvement and without this complication, but in which all had aortic insufficiency. No major differences were observed between the two groups as regarded symptoms, physical findings or other diagnostic criteria, but added that extreme stenosis of the coronary openings due to syphilis predisposes to sudden death. Van Muijden and Scherf[97] stated that there is a sixth type of angina pectoris, a form of syphilitic mesoaortitis, in which the inflammation of the coronary openings has produced a stricture of a severe nature. Pincoffs and Love[98] reported 15 cases of syphilitic ostial stenosis of the coronary arteries, in which from the time of onset of symptoms, the clinical course was unusually brief, characterized by a lack of response to therapy, a high incidence of anginal pain, and a marked tendency to terminate with sudden death.

5. *Other Infections:* Welford and Hoyne[99] reviewed 496 cases of diphtheritic myocarditis which devloped in 4,671 diphtheria patients, with a fatality of 62% in the 496 who had myocardial involvement. The mortality was highest, 70%, in cases which had nasal involvement and lowest, 11% in simple tonsillar diphtheria; 79% of all deaths occurred during the first 14 days of the disease, the average day on which death occurred being the tenth. Abdominal pain and vomiting with a falling pulse rate and blood pressure were of grave prognostic significance; and the only medicament of value in these extensive toxic myocardial degenerations was parenterally injected glucose. Mautner[100] demonstrated permanent cardiac conduction disturbances after diphtheria. Carden[102] descrbed nine cardiac and rheumatoid arthritic cases which occurred in one family group, where he believed that there was a definite direct contagion factor.

6. *Thyrotoxic:* McKinlay[102] expressed the opinion that the intensity of the hyperthyroidism may not be

great but its duration into the heart age gives a reasonable and physiologic explanation for the provocation of auricular fibrillation and the possible acceleration of the development of organic heart disease. Lahey and Hurxthal[103] presented evidence to prove that thyrocardiac patients in seemingly hopeless stages of decompensation can be restored to a great degree by subtotal thyroidectomy; their follow-up of 300 thyrocardiacs proved that at least 71.5% of patients with auricular fibrillation can be restored to and remain in normal rhythm following thyroidectomy. The mortality, 4.25%, was low for the serious situation; compensation was restored and persisted in at least 95% of the cases. Eggleston[104] emphasized that in the medical treatment of the thyrocardiac the results of cardiac therapy alone are not satisfactory. Golden and Brams[105] reported no variations in the venous pressure in thyroid dysfunction both before and after thyroidectomy where none of the patients had any evidence of cardiac embarrassment. Parkinson and Hoyle[106] stated that there is a thyrotoxic hypertension, a term applicable to a group of patients with hypertension in whom there are ruling features of tachycardia and chronic goiter.

7. *Myxedema:* Ohler and Abramson[107] reported electrocardiographic studies in 35 cases of myxedema; 13 showed abnormal changes in the electrocardiogram, such as low voltage and inverted T-waves in all leads, and the findings returned to normal in all of these cases following treatment with thyroid gland extract. Freeman[108] reported a case of chronic pericardial effusion occurring in myxedema, in which the pericardial effusion was rapidly absorbed when sufficient thyroid was given to bring the metabolic rate up to the accepted low normal. Lerman, Means and Clark[109] presented changes in the size of the heart and in the blood pressure of 18 patients with myxedema under thyroid medication; they added that it is characteristic of the heart to be enlarged and to undergo appreciable shrinkage as the disease subsides under thyroid extract.

8. *Hypertension:* Levine[110] examined pathologically 27 hypertensive hearts for myocardial changes and noted that only 11 had marked organic changes in the arterial tree; he suggested that one is forced to rely on an explanation of functional disturbances that acted over a long period of time and in a mild degree. Rosenthal,[111] in very extensive studies on atherosclerosis, stated that arterial tension as determined by the weight of the heart was an important factor in the production of atherosclerosis, but that atherosclerosis and hypertension are not synonymous, since in 48% of his cases atherosclerosis occurred without hypertension. Lissner[112] reported that palliative effects on the reduction of hypertension and its secondary symptoms followed the use of 10cc. of a 10% magnesium sulphate solution given intravenously daily. Ayman[113] used large doses of the crystalline ovarion hormone in cases of hypertension without any noticeable effect on the blood pressure. Bruen[114] gave large doses of bismuth subnitrate by mouth to 20 patients under excellent control without any demonstrable effect on the blood pressure. The DeCourcy's and Thuss[115] advocated partial bilateral suprarenalectomy in the treatment of essential hypertension; others have reported cases where section of the anterior spinal nerve roots,[116] sympathectomy,[117] and resection of the splanchnic nerves[118] were performed.

9. *Pulmonary:* Dyson[119] described a series of 18 cases of pulmonary heart disease in pneumoconiosis, with the diagnoses established by roentgenography and the electrocardiogram. This, he indicated, is not a rarity in anthracite coal miners. No attempt was made to explain why pulmonary heart disease occurrs in some cases of marked pneumoconiosis, but not in other cases equally marked.

10. *Coronary:* Hamman[120] remarked that the period has passed when one made a diagnosis of coronary occlusion without difficulty, because now the diagnosis is made too often when other conditions should be considered; he called attention to five conditions which are most often confused with coronary occlusion, as upper abdominal disease, pericarditis, pulmonary embolism, rupture of the aorta, and interstitial emphysema of the lungs. Levy, Bruenn, and Kurtz[121] reviewed 762 cases of cononary artery disease autopsied during the period from 1910 to 1931; in 97.2% of the cases arteriosclerosis was the cause, and syphilitic involvement of the coronary orifices was responsible in 5.7% of the cases. They suggested that the increase in coronary artery disease should not be a matter of concern but rather a source of satisfaction that men are surviving to an age when they develop disorders of senescence. Averbuck[122] reported 6 cases of pulmonary embolization in which the syndrome was not unlike acute coronary thrombosis, and suggested the possibility of a differential diagnosis with attempted surgical removal of the pulmonary emboli. Slater and Kornblum[123] reported a case of bilateral coronary occlusion with mitral stenosis which furnished an unusual example of the remarkable potentialities of the various compensatory mechanisms the heart and its blood supply can undergo. Sager,[124] from a study of 17 cases previously reported in the literature and a case report of his own, stated that in coronary thrombosis with perforation of the infarcted interventricular septum, the patient's symptoms were typical of acute coronary thrombosis but that the cardiac signs were identical with those of congenital patency of the interventricular septum. Barnes[125] stated that when the social structure and ideals of our civilization will allow individuals to live leisurely and to survive, then we may anticipate some amelioration of coronary sclerosis. Barach and Levy[126] again commented on the use of oxygen in the treatment of acute coronary thrombosis, and stated that its effective use may be responsible for the saving of life in addition to great symptomatic relief. Jacobi, Kenler and Silverman[127] reported a case of acute coronary occlusion in a 47-year old white female due to an embolus from an old thrombus of the femoral vein in the presence of a patent foramen ovale. DeCoursey[128] studied autopsied cases of sudden death and suggested the following rule: unless there were signs definitely indicating other disease in a white male over 40 years of age who died within three hours after the onset of either respiratory, cardiac, or gastric symptoms, the cause of death was coronary occlusion. Barnes[129] re-

ported two cases of painless coronary occlusion that occurred post-operatively, and in which the diagnoses were confirmed by the precordial lead (Lead IV) of the electrocardiogram after the conventional three leads had failed to show definite signs. Steinberg[130] first observed that a high nonprotein nitrogen in the blood occurred in association with coronary thrombosis, and that a nitrogen reading that remained high or continued to rise was an ill omen. White,[131] in discussing the non-painful features of coronary occlusion, stated that the responsibility of the physician is very great, both to insist on adequate rest after the infarction and to avoid unnecessary time and expense on the part of the patient if no infarction has occurred. Fishberg, Hitzing and King[132] studied the circulatory dynamics in 59 patients with recent myocardial infarction, and noted that two distinct mechanisms participated in the circulatory derangement, either shock or peripheral circulatory failure and heart failure or both.

11. *Miscellaneous:* (a) *Pregnancy:* Lamb[133] noted that the incidence of cardiac murmurs in pregnant women in his series of cases was 6.1%, of which 2.7% had organic heart disease. Rheumatic heart disease caused about 90% of the heart lesions, and the mortality was 7.5%. Lamb emphasized that prenatal care was the most important factor in the reduction of the mortality, and pointed out the dire need for follow-up studies to determine what happens to the cardiac mother and her child after the lying-in period. Stander[134] presented 81 cases of pregnancy and heart disease with only one death which was due to negligence of the patient and her husband. Twenty-four of these patients delivered spontaneously and 21 required full term operative deliveries, 11 of these being low forceps. Only 6 had premature deliveries, 5 spontaneous and one operative; there were 5 abortions, two inevitable and three therapeutic.

(b) *Diabetes:* Kalinberg[135] studied the heart by means of the electrocardiogram in 55 case of diabetes mellitus, and concluded that the best therapy for the diabetic heart lies in the treatment of the diabetes.

(c) *Adiposity:* Willius and Smith[136] reported a case of congestive heart failure in a 35-year old male weighing 550 pounds without any other evidence to indicate the cause of the insufficiency.

(d) *Surgery:* Purks[137] compared the causes of death in 60 patients with organic heart disease who had been subjected to operation with the causes of death in a similar group of 60 non-cardiac patients, and concluded that in the well treated cardiac, congestive failure is not a very significant factor as a cause of death following operation. The cardiac group differed from the non-cardiac group mainly in the presence of fatal coronary occlusion and in the greater incidence of fatal pulmonary complications, such as pulmonary embolization and infections.

(e) *Exertion:* Tung, Hsich, Bien and Dieuaide[138] examined 46 healthy Chinese ricksha pullers in a study of the effect of chronic exertion on the cardiovascular system, and noted definite cardiac enlargement in 45% of the cases, but found no indication that the enlargement constituted or predisposed to heart disease.

6. PATHOLOGY

1. *Myocardial:* Nelson[139] reported a case of acute diffuse myocarditis following exfoliative dermatitis in the course of treatment of a latent syphilis with arsenic. Maxwell and Barrett[140] reported a case of acute interstitial myocarditis following a severe dermatitis due to sulphur ointment, in which they emphasized the disastrous results that may follow the indiscriminate use of proprietary remedies. Salzman[141] reviewed 718 cases of spontaneous cardiac rupture gathered from the literature and reported 7 of his own cases; he noted that this condition most frequently occurred in an area of infarction 5 to 14 days following the coronary occlusion, and that most important was the differential diagnosis because the condition was most often confused with acute abdominal conditions. Clowe, Kellert and Gorham[142] reported a case of spontaneous rupture of the right auricle in a supposedly normal 43-year-old white male where trauma and excessive exertion were absent; serial electrocardiograms showed suggestive changes of coronary occlusion and pathologically showed a process essentially similar to that causing rupture of the ventricle. Elson[143] described a case of free ball thrombus in the left auricle in a 53-year-old white female with mitral stenosis and auricular fibrillation who had widespread and transitory disturbances in the peripheral circulation, such as cadaveric coldness, disappearance of pulsations, and marked cyanosis which involved the finger tips, toes, or even the tip of the nose. Barnes, Beaver and Snell[144] reported a case of primary sarcoma of the heart in which the diagnosis was made during life because of the peculiar existence of the signs of pericarditis, heart-block, and metastasis to the skeletal system. Burke[145] reported on 327 necropsies of patients with known malignant manifestations and found only 14 cases (4.3%) with metastatic involvement of the cardiac muscle. Lymburner[146] studied tumors of the heart and concluded that there are no pathognomonic signs or symptoms of heart tumors; one may strongly suspect a tumor of the heart when sudden and unexpected cardiac symptoms occur, which are progressive and regressive, especially if associated with an evanescent cardiac murmur, and the cardiac failure is not responsive to digitalis. Hirshboeck[147] reported a case of myocardial calcification subsequent to coronary occlusion in which the plaquelike calcification involved the area of the heart muscle supplied normally by the occluded descending branch of the left coronary artery.

2. *Endocardial and Valvular:* McGinn and White[148] stated many important clinical observations on aortic stenosis; that it is evident from an analysis of their material that all grades of aortic stenosis exist; that aortic stenosis even of considerable degree is common, particularly in males; that it is often caused by infection, especially rheumatism; that calcareous changes are found chiefly in older patients, no matter what the cause; that it is less serious than aortic regurgitation of high degree, being found in many old patients after years of valvular disease; that it is sometimes associated with considerably hypertension; and that, due to its variable symptoms and signs, it is often

overlooked when it should be diagnosed clinically. Bishop, Bishop and Trubek[149] analyzed cases of aortic stenosis of inflammatory origin and reported that the presence of associated cardiovascular abnormalities, such as coarctation of the aorta and patent ductus arteriosus, cannot be taken as presumptive evidence for a congenital defect underlying the calcified aortic cusps. Frothingham and Hass[150] reported a very unusual case, rupture of several normal chordae tendineae of the mitral valve in a 64-year-old white male, leading to incompetency of the mitral valve and resulting myocardial insufficiency. Morgan[151] reported a tumor of the tricuspid valve from a malignant teratoma of the testicle. Jaleski[152] reported a myxoma of the tricuspid valve in a 62-year-old female. Campbell and Carling[153] attributed the sudden death of their patient to a fibrinous polyp of the aortic valve.

3. *Pericardial:* Barton and Freeman[154] reported a case of pericardial hemorrhage complicating scurvy which caused the death of a mental patient who had been allowed to select his own diet. Comroe[155] reported the case of a 57-year-old white male who suddenly developed a massive hemopericardium which cleared up after 2 pericardial taps withdrew 1500cc. of almost pure blood; the cause remained unknown, but in spite of a normal electrocardiogram the author believed that the hemopericardium resulted from the rupture of a sclerotic vessel in a hypertensive individual. Heninger[156] stated that the relative frequency of metastatic malignancies to the pericardium was 7.5%; he emphasized the value and importance of cellular studies of the fluid from pericardial effusions as a diagnostic aid. Beck and Cushing[157] analyzed the syndromes of acute and chronic intrapericardial pressure; the acute phase is usually caused by hemorrhage from wounds of the heart or of the coronary vessels, rupture of the weakened myocardium, or from an aneurysm of the heart. The clinical picture of the chronic phase is that of Pick's polyserositis; surgery was carried out in 6 of the 9 cases of chronic intrapericardial pressure reported with alleviation of symptoms. Bellet, McMillan and Gouley[158] studied 17 cases of tuberculosis periocarditis clinically and anatomically and emphasized certain features; there was almost universal involvement of the mediastinal glands, with accompanying tuberculosis of the lungs or other viscera very frequently. In 14 of the 17 cases there were no murmurs audible, and in the other 3 rather inconspicuous systolic murmurs were present at the apex. Peel[159] described 6 cases of pericarditis associated with displacement of the RT segment of the electrocardiogram similar to that which occurs in coronary thrombosis. Schwartz[160] reported a case of a 50-year-old male who developed a pericardial effusion following an acute coronary thrombosis, which subsided with pericardial paracentesis and rest. Hitzenberger[161] recommended that pericardial puncture for the treatment of exudative pericarditis be performed through the pleura from the back, but before resorting to this route of drainage it should be determined by a test puncture whether the exudate is free from pus to avoid the production of a pleural empyema.

4. *Vascular:* Blalock[162] successfully sutured a wound of the ascending aorta in an 18-year-old colored male; this was a wound of the intrapericardial portion of the aorta caused by an ice-pick. Souttar[163] advocated the treatment of aneurysm of the innominate artery by proximal ligature as the risks of the operation entirely justify the gravity of the situation. Parks[164] reviewed the literature to show that very few references can be found to dynamic dilatation of the aorta, a condition which is common in aortic insufficiency, hypertension, hyperthyroidism, and congenital stenosis of the aorta; he reported one case in which the marked dilatation of the aorta, demonstrable by roentgen examination, was not found at the pathological examination. D'Aunoy and Haam[165] reported two cases of aneurysm of the pulmonary artery with patent ductus arteriosis, where both cases well demonstrated the importance of two factors in the etiology of aneurysm, damage to the vessel wall and increased blood pressure. Fowler[166] stated that obliterating thrombosis of the pulmonary arteries occasionally occurred as a complication of various cardiac and pulmonary conditions and that in certain of these cases which reach a quiescent stage the recognition of the condition may be beneficial. Greenspan[167] reported four cases of carcinomatous lymphangitis of the lung, all secondary manifestations; in two of the cases right ventricular cardiac failure was the direct result of the diffuse obliterative endarteritis of the pulmonary vessels. He suggested that in cases of right ventricular cardiac failure presenting no significant pulmonary or cardiac findings the possibility of a diffuse secondary carcinomatous lymphangitis of the lungs with an accompanying endarteritis of the pulmonary vessels should be considered. White, Badger and Castleman[168] reported a case of dissecting aneurysm of the aorta wrongly diagnosed as coronary thrombosis, and mentioned three clues that pointed to dissecting aneurysm; the maintenance of hypertension through the course of the acute illness, the excellent heart action throughout, and the absence of coronary T waves from the electrocardiogram during the first five days after the onset of the chest pain in a severely ill patient.

7. FUNCTIONAL DISORDERS

1. *Congestive Failure, Including the Use of Digitalis and Diuretics:* Christie and Meakins[169] demonstrated a marked decrease in the distensibility and slight impairment of the elasticity of the lung by taking simultaneous tracings of the volume of tidal air and of the intrapleural pressure in heart failure with congestion; an increase in the intra-abdominal pressure by means of an abdominal belt could overcome the functional difficulties in this type of breathing where there was a diminution in the excursion of the diphragm. Stroud, Bromer, Gallagher, and Vander Veer[170] tried the purified glucoside and the whole leaf preparation of digitalis on 25 ambulatory cases of established auricular fibrillation over a period of fifteen months, interchanging the various preparations; they concluded that no significant difference could be noted in the clinical pictures of the several groups. Smith and Luten[171] reported 16 cases of heart failure in advanced cardiac disease where they compared the effects of

glucose and digitalis and noted that glucose failed to restore compensation in any single case; according to their results glucose is indicated as an emergency measure in cases of acute or urgent heart failure and in cases of advanced chronic heart failure in which digitalis in adequate amounts has not restored compensation. Smith[172] used 175 cc. of salyrgan in one patient over a period of three years and felt that the drug was of inestimable value in removing ascites and edema and improving the circulatory efficiency of the patient. Dixson[173] reported a case of cardiac insufficiency with latent edema in an aged individual who had received at least 150 injections of salyrgan in 20 months with no demonstrable ill effects. Stroud and his co-workers[174] reported on the use of verodigen, a digitalis glucoside, which, they found, is biologically about 130 times as potent as dry standardized digitalis leaf; clinically it was noted to have many of the same characteristics as digitalis with the exception of a very much smaller dosage, 1/240 grain of verodigen comparable to 1½ grains of the powdered digitalis leaf, and the potency demanding very careful observation in its administration.

2. *Cardiac Neuroses:* Edwards and White[175] analyzed 5,000 consecutive patients with cardiac symptoms and signs seen by them in private practice in New England over a period of 13 years; they found 687 cases (13.7%) with definite neurocirculatory asthenia; 448 (65.2%) were uncomplicated by organic heart disease, and 135 (19.6%) were complicated by organic heart disease; there were 104 (15.2%) in which the functional condition was present with doubt as to the presence or absence of organic heart disease. 61.7% were females and 38.3% were males; 51% were in the age group 31 to 50 years inclusive. The types of heart disease found in this series were as follows: rheumatic, 44.4%; coronary, 21.4% and hypertensive, 18%. They concluded that even though organic heart disease is present, the symptoms may be entirely the result of a complicating neurocirculatory asthenia.

3. *Angina Pectoris:* Evans and Hovle[176] reported a series of 122 patients with angina pectoris (angina of effort) who had been observed over a period of 3 years with special reference to the comparative value of vasodilator drugs for the immediate treatment and prevention of the attacks. Glycerol trinitrite deservedly held first place in the treatment routinely; the use of this drug immediately before expected attacks was a safe means of preventing the pain; in their series, 84.5% of the patients obtained great benefit, and another 12.5% moderate benefit by using the drug in this manner; no harmful effects were noted in this type of treatment. Eppinger and Levine[177] reported 141 fatal cases of angina pectoris, 111 men and 30 women, in whom the average duration of the angina was 4.5 years, varying from a few weeks to 23 years; there appeared to be little difference in the duration of life and the age at death of patients having attacks while at rest or exclusively on effort. LaPlace and Crane[178] made observations in a series of 36 patients on the relationship of ischemia to the development of pain and fatigue in the contracting muscles of the arm; on the basis of these observations it was concluded that constitutional nervous sensitivity is not a significant factor in the occurrence of angina pectoris. Elliot[179] reported a case of a 55-year-old woman with chronic anemia and repeated epistaxis who had attacks of angina pectoris over a period of 3 years; these attacks became extremely severe with the occurrence of a febrile illness, and at autopsy a hypertrophied but otherwise normal heart was found, so that the cause of the angina was evidently the myocardial ischemia due to the anemia. Baltzan[180] clinically classified angina pectoris into four types; the maligna of recumbency marked by restlessness; the vera of effort marked by standstill; the simplex of oppression marked by asthenia; and the similans of hyperesthesia, marked by inframammary pain. White and Sharber[181] analyzed the past habits as to the use of tobacco and alcohol of 750 consecutive private patients with angina pectoris, and of 750 individuals without angina of exactly the same sex and age incidence and from the same walks of life. They concluded that neither the use nor the abstinence from tobacco or alcohol played an important role in the genesis of angina pectoris; in occasional cases the use of tobacco aggravated or precipitated an attack of angina pectoris, and in occasional cases alcohol helped to prevent or relieve such attacks. Nachlas[182] discussed three cases of arthritis of the cervical spine with pseudoangina pectoris, and pointed out that in these cases the pain was not substernal, was not brought on by dietary indiscretions, and not precipitated by emotional stress. Scherf and Schnabel[183] observed that atropine increased the frequency of the heart and stated that in angina pectoris great caution is necessary when atropine is used. Von Bergman[184] cited experiments and clinical observations to emphasize that oxygen deficiency in parts of the cardiac muscle is the most important factor in the development of angina pectoris. Edens[185] stated that strophantin given intravenously in the angina pectoris of older persons with coronary sclerosis is especially valuable. Riseman and Stern[186] described a simple and safe standardized exercise tolerance test for patients with angina pectoris on exertion, which proved to be of value as an aid in diagnosing doubtful cases and in evaluating both the condition of the patient and the results of therapy.

4. *Arrhythmias, etc.*—(a) *Paroxysmal Tachycardia, etc.:* MacKinnon[187] studied the rhythm of paroxysmal tachycardia by means of the electrocardiograph and noted that the common type is markedly regular, with such departures from the regular rhythm being so slight that the ear did not note them; certain cases of auricular paroxysmal tachycardia may be clinically irregular, but the electrocardiogram must prove this beyond dispute. Field, Barder, and Alexander[188] reported a case of an extreme tachycardia which persisted for four weeks and led to congestive failure in an otherwise healthy man; all the usual methods of interrupting the attacks had failed so that an attempt was made to terminate the rapid heart action by exposing the vagus nerves in the neck and stimulating them electrically, but there was no demonstrable effect on the heart. A partial digitalis heart-block resulted in

slowing of the ventricles and was followed by improvement; eventually the auricles gradually slowed, the heart-block disappeared, the cardiac response to vagal activity returned, and the patient recovered. Lundy and McLellan[189] reported 3 cases of paroxysmal ventricular tachycardia of their own and reviewed 149 cases from the literature. They noted that the basic features were many; males developed it twice as often as females; that no demonstrable heart disease was present in 14% of the cases, and that the prognosis was very grave in those due to digitalis excess and only relatively less so in the other types. Prinzmetal and Kellogg[190] stated than paroxysmal ventricular tachycardia may often be differentiated from the auricular type when there are jugular pulsations at a slower rate than the apical rate; this sign has certain limitations but can be applied to about 66% of the reported cases. The coexistence of auricular fibrillation was the only important condition which rendered the sign valueless. Elliot and Fenn[191] reported an unusual case of long continued ventricular tachycardia in a 19-year-old obese white female who had five paroxysms that lasted a total of 59½ days; all attempts failed to stop the paroxysms of such unprecedented duration.

(b) *Auricular Fibrillation and Flutter:* Bramwell[192] reported a case of auricular fibrillation following a head injury in an otherwise healthy miner; this was only advanced as a theory which the author hesitated to accept since the fibrillation persisted for four weeks and then promptly yielded to quinidine therapy with no tendency to recur. Mohler and Crawford[193] studied the hearts of 15 fibrillators and 7 non-fibrillators with mitral valve lesions along with the hearts of 9 fibrillators with arteriosclerosis as the etiologic factor; nothing was found to indicate that the type of pathologic lesion could be responsible for the onset and continuation of the fibrillation. The etiologic factors determined the type of pathologic changes in the heart to a greater extent than did the presence or absence of fibrillation. Ernstene and Mulvey[194] reported that 16 (7%) of 213 patients with hyperthyroidism had auricular fibrillation during the preoperative period; while postoperative fibrillation occurred in 31 (16%) of the 197 patients who had normal rhythm before the operation. The age of the patient, the type of goiter, and the duration of the hyperthyroidism appeared to be the most important predisposing factors to the development of postoperative auricular fibrillation. The degree of elevation of the basal metabolic rate was of little significance; postoperative fibrillation was more common in the thyrotoxic patients with adenomatous goiter than in those with the hyperplastic type. It generally began during the first 60 hours after the operation, rarely caused circulatory embarrassment, and normal rhythm was usually established spontaneously within 48 hours. Friedlander and Levine[195] analyzed 35 cases of auricular fibrillation and 4 cases of auricular flutter in which no other signs of cardiac disease were demonstrated; these composed about 6% of all the patients with auricular fibrillation, and 20% of all those with auricular flutter seen in private practice. 43.6% were over 50 years of age, and there were only 3 females in all; the inciting factor was elicited in 15 cases and given in the order of frequency were exertion, gastrointestinal disturbances, alcohol, and upper respiratory infections; digitalis diminished the frequency of transient attacks of fibrillation, but was practically ineffective in restoring normal rhythm in the permanent group where quinidine was very effective in restoring normal rhythm. These irregularities may be due to the "trigger mechanism" of neurogenic origin, and this study emphasized the fact that auricular fibrillation and flutter must be regarded in some cases as benign or functional in origin. Campbell and Suzman[196] reported a case of rheumatic heart disease with auricular flutter of six years duration which suddenly reverted to normal rhythm, continued for 3 months, and just as suddenly returned to the circus mechanism of flutter.

(c) *Quinidine Therapy:* Maher, Sullivan and Scheribel[197] administered quinidine sulphate to 19 patients; 10 received 30 grains orally per day, 3 received 60 grains orally per day, and 6 received intravenous of 3 to 5 grains, all without general toxic effects. The electrocardiogram in the majority of these patients showed changes only in regard to the T waves, within 24 to 72 hours if orally administered and immediately if given intravenously; these changes varied from a mild flattening to sharp inversion of the T waves and the duration of the effect varied from 3 to 6 days on oral administration and 3 hours on intravenous administration. Sweeney[198] estimated that in about 60% of the carefully selected cases of auricular fibrillation, quinidine causes a reversion to normal rhythm; if the reversion does not occur in the first few days, the drug should be continued for 10 days and after a rest period of 10 days the drug may be tried again, but if the first trial is not successful, subsequent trials are more likely to fail. Jezer and Schwartz[199] reported an unusual case of transient amblyopia and of an ectopic rhythm resembling ventricular tachycardia following the administration of quinidine sulphate for auricular flutter. Schwartz and Jezer[200] administered quinine hydrochloride and quinidine sulphate intravenously in graded doses to two patients with auriculoventricular dissociation who were subject to transient seizures of ventricular fibrillation; from this study they stated that the use of such drugs intravenously is contraindicated in such patients because transient periods of ventricular fibrillation were precipitated in the very patients who are subject to such attacks.

(d) *Heart-Block.* 1. *Complete or Auricular-Ventricular:* Gilchrist[201] studied the action of amyl nitrite in 7 cases of complete heart-block, and concluded that a negative response, no change in the bradycardia, favored such a diagnosis; yet a positive response, an increase in the ventricular rate, did not exclude this diagnosis. Thomsen[202] reported a case of sinus arrhythmia with Adams-Stokes syndrome, and stated that this syndrome is not exclusively connected with complete heart-block, but may occur with sinus arrhythmia and with sino-auricular block which are regarded as benign functional disturbances. Perlstein[203] reported a case of complete heart-block following influenza, in which a syncopal attack was induced following

the subcutaneous injection of 1:1000 adrenalin chloride. Strong[204] reported a case of paroxysmal ventricular tachycardia complicating complete heart-block; this was in a 53-year-old white female who had had a thyroidectomy six months previous to the appearance of the block, and the ventricular tachycardia that appeared later. Yater, Barrier and McNabb[205] studied, by serial sections, an unusual case of acquired heart-block with Adams-Stokes attacks dependent upon a defect in the interatrial septum; the heart-block was due to a fibrosis of the Bundle of His as it ran in the very edge of the interventricular septum defect. Gilchrist[206] noted the effects of body rest, muscular activity, and induced pyrexia on the ventricular rate in complete heart-block; he concluded that the ventricular rate in these cases is not fixed, but under conditions of rest fluctuates through a range of rate more or less peculiar to the individual; and that the important factor in promoting myocardial efficiency in these cases is the ability to quicken the ventricular rate in response to the demands of physical exertion. Gordon[207] analyzed 9 cases of complete heart-block and suggested that the diagnosis can be made clinically based on the following features, listed in the order of importance, as a slow pulse with regular rhythm, enlargement of the heart, high systolic blood pressure, a wide pulse variation pressure, history of syncopal attacks, variability of the first heart sound, and a capillary pulse. Hill and MacKinnon[208] reported a case of heart-block in which Adams-Stokes attacks were associated with Cheyne-Stokes respiration. Perry and Rogers[209] reported a case of complete heart-block caused by a lymphangio-endothelioma of the heart.

2. *Intraventricular Heart-Block:* Lewis[210] determined the nature of the physical signs present in 20 patients with bundle-branch block and in 3 patients with atypical block of this type by means of records of the heart sounds and by apex electrocardiograms; he concluded that the nature of the physical signs present was not such as to permit their use as diagnostic signs of bundle-branch block. King[211] analyzed 155 cases of bundle-branch block of varied etiology; the important functional disorders in the order of incidence were auricular fibrillation, bundle-branch block, A-V heart-block, and auricular flutter. King considered the prognosis in this type of block very grave, regardless of the etiology, although it appeared best in those cases of rheumatic origin. Its occurrence seemed to add nothing to the gravity of the prognosis of syphilitic heart disease; and bundle-branch block should be considered one of the rather common, as well as important, clinical entities. Perry[212] observed the onset of bundle-branch block with the occurrence of coronary thrombosis 45 hours later. Bayley[213] stated that bundle-branch block is a common lesion; of 70 case records of this lesion that he examined, only one instance was encountered in which the routine physical examination suggested a bundle-branch block. Von Deesten and Dolganos[214] presented 5 cases of atypical bundle-branch block showing typical curves; one patient was alive at the end of 11½ years at the age of 72 years; another was alive at the end of 8½ years at the age of 54 years; 4 had no cardiac symptoms at the time of writing; numerous electrocardiograms in 4 of these patients have remained the same through many years; hypertension was present in only one of these patients. Willius and Anderson[215] reported a case of transient, recurrent, complete bundle-branch block which they felt denoted that the heart still had the ability, probably through spontaneous augmentation of its own circulation, to recover sufficiently to permit relatively normal conduction.

3. *Sino-Auricular Heart-Block, etc.:* Marcellus[216] reported an autopsied case of migratory pacemaker in a 50-year-old white male who died 2½ years after the condition was recognized by means of a routine electrocardiogram. Light[217] reported a case of sino-auricular block with ventricular escape in which he pointed out certain peculiarities in the conduction system. Coogan[218] analyzed an unusual case of coupled ventricular beats in a 38-year-old female that was presumed to be on an emotional basis. Duchosal and Sciclounoff[219] reported a case of intermittent nodal rhythm in the course of scarlet fever.

8. PROGNOSIS

Viko[220] attempted to evaluate certain prognostic data in arteriosclerotic heart disease more as a plea against an undue attitude of hopelessness in judging the outlook for this type of heart disease; of 153 patients, 117 males and 36 females, ages 46 to 89, average 67.5 years, 28 expired with the anginal syndrome, 33 from congestive heart failure, and 15 from non-cardiac causes, with a total of 77 still alive. Falk[221] suggested four observations that help in evaluating the ultimate prognosis in heart disease; 1. The degree of effort or stress required to produce dyspnea or anginal syndrome; 2. The appearance of clinical signs known to have an ominous significance, such as gallop rhythm, pulsus alternans, coronary occlusive episodes, paroxysmal nocturnal dyspnea, and severe congestive failure not responding well to digitalis, diuresis and rest; 3. The presence of marked myocardial enlargement with a history of gradually lessening reserve; and 4. Evidence of progressively abnormal changes in serial electrocardiograms.

9. SPECIAL TREATMENT

Total Ablation of the Thyroid Gland: Friedman and Blumgart[222] reported on the necessity for total ablation of the thyroid gland, if such a procedure is performed in chronic heart disease; this was emphasized by the failure to benefit such patients by subtotal thyroidectomy, unsuccessful attempts to remove residual fragments at a subsequent operation, and the ineffectiveness of roentgen irradiation on the remaining tissue. Blumgart and his co-workers[223] stated their conception of a hypothetical case of congestive heart failure that they would consider a favorable candidate for this operation; between 20 and 50 years of age, with arteriosclerotic or rheumatic heart disease and a basal metabolic rate of about the average normal, with no evidence of bronchiectasis, severe renal insufficiency, active rheumatic fever, or recent coronary thrombosis, who has suffered for several years from decompensation on slight exertion so that he is unable to work in spite of medical and hospital treatment; his condition

has not become rapidly worse, but he is incapacitated, yet always regains compensation after resting in bed for several weeks, indicating some cardiac reserve. The hypothetical patient with angina pectoris has attacks on slight exertion, but not at rest, and does not show any of the unfavorable factors mentioned above. Weinstein and his colleagues[234] described observations on the immediate post-operative relief of chest pain after total thyroidectomy in 19 patients, and suggested that complete bed-rest should be enforced despite the early subjective relief experienced by the patient, until the basal metabolic rate shows a significant lowering. Eppinger and Levine[235] stated that in the postoperative care of patients following total thyroidectomy, three complications may occur; hoarseness and aphonia, which is rare; postoperative tetany, which is uncommon; and mild symptoms of myxedema which occurs in almost all of the cases. They further suggested that these patients should be given the same sort of medical advice as is given to the cardiac patients in general, except where improvement has occurred to permit greater activity. Brenner, Donovan, and Murtagh[236] reported on six patients who showed slight to fairly marked improvement following total thyroidectomy for congestive heart failure and angina pectoris, but felt that the cases were too recent for permanent results to be judged.

4758 N. Kimball Ave.

BIBLIOGRAPHY

1. Am. J. M. Sc. **187**: 1, 1934.
2. M. Clin. N. Amer. **17**: 1141, 1934.
3. J. A. M. A. **103**: 151, 1934.
4. Ann. Int. Med. **8**: 497, 1934.
5. M. Clin. N. Amer. **18**: 727, 1934.
6. Am. J. Path. **10**: 253, 1934.
7. Arch. Int. Med. **53**: 574, 1934.
8. Am. Heart J. **9**: 347, 1934.
9. Quart. J. Med. **27**: 237, 1934.
10. Am. Heart J. **9**: 500, 1934.
11. Quart. J. Med. **27**: 437, 1934.
12. Arch. Int. Med. **54**: 239, 1934.
13. M. J. Australia **1**: 613, 1934.
14. Am. Heart J. **10**: 156, 1934.
15. Am. J. M. Sc. **187**: 642, 1934.
16. Semana med. **41**: 1937, 1934.
17. Arch. Int. Med. **53**: 782, 1934.
18. J. Clin. Investigation **13**: 495, 1934.
19. Am. Heart J. **9**: 405, 1934.
20. Am. J. M. Sc. **187**: 16, 1934.
21. Ann. Int. Med. **8**: 177, 1934.
22. Am. J. M. Sc. **188**: 498, 1934.
23. Am. Heart J. **9**: 642, 1934.
24. Wiener klin. Wochen. **47**: 1057, 1934.
25. Ann. Int. Med. **8**: 46, 1934.
26. Am. Heart J. **10**: 110, 1934.
27. Am. J. M. Sc. **187**: 489, 1934.
28. Am. Heart J. **9**: 706, 1934.
29. Am. J. Roentgenol. **31**: 1, 1934.
30. J. A. M. A. **102**: 432, 1934.
31. Ibid. **102**: 591, 1934.
32. Am. J. Roentgen. **31**: 588, 1934.
33. Brit. M. J. **1**: 1028, 1934.
34. Quart. J. Med. **27**: 587, 1934.
35. Wien. Arch. f. inn. Med. **24**: 387, 1934.
36. Minerva Med. **2**: 261, 1934.
37. M. Clin. N. Amer. **18**: 491, 1934.
38. Am. Heart J. **10**: 230, 1934.
39. Ibid. **10**: 208, 1934.
40. Am. J. M. Sc. **187**: 652, 1934.
41. Penn. M. J. **37**: 566, 1934.
42. Am. Heart J. **9**: 697, 1934.
43. Arch. Int. Med. **53**: 561, 1934.
44. J. Clin. Investigation. **13**: 853, 1934.
45. Am. J. M. Sc. **188**: 691, 1934.
46. Arch. d. mal. du coeur. **27**: 155, 1934.
47. Brit. M. J. **1**: 278, 1934.
48. Am. Heart J. **9**: 283, 1934.
49. New York State J. Med. **34**: 393, 1934.
50. Pub. Health Rep. **49**: 912, 1934.
51. J. A. M. A. **103**: 157, 1934.
52. Am. J. M. Sc. **188**: 639, 1934.
53. Arch. Int. Med. **54**: 339, 1934.
54. Am. Heart J. **10**: 101, 1934.
55. Am. J. Path. **10**: 375, 1934.
56. Arch. Dis. Child. **9**: 27, 1934.
57. Am. J. M. Sc. **187**: 663, 1934.
58. Am. Heart J. **9**: 304, 1934.
59. J. A. M. A. **102**: 1660, 1934.
60. Arch. Int. Med. **53**: 35, 1934.
61. Am. Heart J. **9**: 533, 1934.
62. Brit. J. Radiol. **7**: 452, 1934.
63. J. A. M. A. **103**: 830, 1934.
64. Northwest Med. **33**: 332, 1934.
65. Missouri State Med. Assn. J. **31**: 346, 1934.
66. Lancet. **2**: 924, 1934.
67. Am. J. M. Sc. **187**: 352, 1934.
68. J. Lab. & Clin. Med. **19**: 695, 1934.
69. J. Clin. Investigation. **13**: 503, 1934.
70. Am. Heart J. **9**: 586, 1934.
71. Am. J. M. Sc. **187**: 773, 1934.
72. M. Clin. N. Amer. **18**: 307, 1934.
73. Arch. Int. Med. **54**: 170, 1934.
74. Am. J. M. Sc. **188**: 301, 1934.
75. Am. Heart J. **10**: 62, 1934.
76. Am. J. Dis. Child. **48**: 780, 1934.
77. Arch. Int. Med. **54**: 799, 1934.
78. Arch. Dis. Child. **9**: 267, 1934.
79. Am. Heart J. **9**: 557, 1934.
80. Ibid. **10**: 190, 1934.
81. Arch. Int. Med. **54**: 952, 1934.
82. Ibid. **53**: 508, 1934.
83. J. Lab. & Clin. Med. **19**: 1304, 1934.
84. Canad. M. A. J. **31**: 269, 1934.
85. J. A. M. A. **102**: 1924, 1934.
86. Arch. Int. Med. **53**: 699, 1934.
87. Am. J. M. Sc. **187**: 672, 1934.
88. Arch. Int. Med. **54**: 710, 1934.
89. Arch. d. mal. du coeur. **27**: 246, 1934.
90. J. A. M. A. **102**: 575, 1934.
91. Am. Heart J. **9**: 686, 1934.
92. New Orleans M. & S. J. **86**: 789, 1934.
93. Ann. Int. Med. **8**: 327, 1934.
94. Lancet. **2**: 350, 1934.
95. Arch. Path. **17**: 729, 1934.
96. Am. Heart J. **9**: 421, 1934.
97. Wien. klin. Wochen. **47**: 746, 1934.
98. Am. J. Syph. & Neur. **18**: 145, 1934.
99. J. Ped. **5**: 642, 1934.
100. Med. Klin. **30**: 669, 1934.
101. J. A. M. A. **102**: 835, 1934.
102. Minnesota Med. **17**: 199, 1934.
103. Am. J. Surg. **24**: 225, 1934.
104. Am. J. M. Sc. **187**, 738, 1934.
105. Am. Heart J. **9**: 802, 1934.
106. Lancet. **2**: 913, 1934.
107. Arch. Int. Med. **53**: 165, 1934.
108. Ann. Int. Med. **7**: 1070, 1934.
109. Ibid. **8**: 82, 1934.
110. Arch. Path. **18**: 331, 1934.
111. Ibid. **18**: 660, 1934.
112. California & West. Med. **40**: 330, 1934.
113. Am. J. M. Sc. **187**: 806, 1934.
114. Am. J. M. Sc. **188**: 21, 1934.
115. J. A. M. A. **102**: 1118, 1934.
116. J. A. M. A. **102**: 1115, 1934.
117. M. Clin. N. Amer. **18**: 577, 1934.
118. Arch. Int. Med. **54**: 577, 1934.
119. Am. Heart J. **9**: 764, 1934.

120. Ann. Int. Med. 8: 416, 1934.
121. Am. J. M. Sc. 187: 376, 1934.
122. Ibid. 187: 391, 1934.
123. J. A. M. A. 102: 39, 1934.
124. Arch. Int. Med. 53: 140, 1934.
125. Ann. Int. Med. 7: 913, 1934.
126. J. A. M. A. 103: 1690, 1934.
127. Am. Heart J. 9: 414, 1934.
128. J. Lab. & Clin. Med. 19: 1272, 1934.
129. M. Clin. N. Amer. 18: 477, 1934.
130. J. Lab. & Clin. Med. 20: 279, 1934.
131. Ann. Int. Med. 8: 690, 1934.
132. Arch. Int. Med. 54: 997, 1934.
133. Am. J. M. Sc. 187: 177, 1934.
134. Am. J. Obst. & Gynec. 27: 528, 1934.
135. Norsk. Mag. f. Laegevidensk. 95: 940, 1934.
136. M. Clin. N. Amer. 18: 471, 1934.
137. Ann. Int. Med. 7: 885, 1934.
138. Am. Heart J. 10: 79, 1934.
139. Ibid. 9: 813, 1934.
140. Arch. Dermat. & Syph. 29: 382, 1932.
141. Am. J. M. Sc. 188: 347, 1934.
142. Am. Heart J. 9: 324, 1934.
143. Ibid. 10: 120, 1934.
144. Ibid. 9: 480, 1934.
145. Am. J. Cancer. 20: 33, 1934.
146. Canad. M. A. J. 30: 368, 1934.
147. Am. Heart J. 10: 264, 1934.
148. Am. J. M. Sc. 188: 1, 1934.
149. Ibid. 188: 506, 1934.
150. Am. Heart J. 9: 492, 1934.
151. J. Lab. & Clin. Med. 19: 749, 1934.
152. Am. J. Path. 10: 399, 1934.
153. Guy's Hosp. Rep. 84: 41, 1934.
154. New England J. M. 210: 529, 1934.
155. Am. Heart J. 9: 680, 1934.
156. Ann. Int. Med. 7: 1359, 1934.
157. J. A. M. A. 102: 1543, 1934.
158. M. Clin. N. Amer. 18: 201, 1934.
159. Glasgow M. J. 4: 149, 1934.
160. Am. Heart J. 10: 253, 1934.
161. Med. Klin. 30: 1362, 1934.
162. J. A. M. A. 103: 1617, 1934.
163. Brit. M. J. 1: 1066, 1934.
164. Am. Heart J. 9: 655, 1934.
165. J. Path. & Bact. 38: 39, 1934.
166. Ann. Int. Med. 7: 1101, 1934.
167. Arch. Int. Med. 54: 625, 1934.
168. J. A. M. A. 103: 1135, 1934.
169. J. Clin. Investigation. 13: 323, 1934.
170. Am. J. M. Sc. 187: 746, 1934.
171. Am. Heart J. 9: 437, 1934.
172. J. A. M. A. 102: 532, 1934.
173. New England J. M. 210: 800, 1934.
174. Ann. Int. Med. 8: 710, 1934.
175. New England J. M. 211: 53, 1934.
176. Quart. J. Med. 27: 105, 1934.
177. Arch. Int. Med. 53: 120, 1934.
178. Am. J. M. Sc. 187: 264, 1934.
179. Ibid. 187: 185, 1934.
180. Canad. M. A. J. 30: 269, 1934.
181. J. A. M. A. 102: 655, 1934.
182. Ibid. 103: 323, 1934.
183. Klin. Wchnschr. 13: 1397, 1934.
184. Deutsche med. Wchnschr. 60: 1378, 1934.
185. Munchen. med. Wchnschr. 81: 1424, 1934.
186. Am. J. M. Sc. 188: 646, 1934.
187. Quart. J. Med. 27: 1, 1934.
188. Am. Heart J. 9: 298, 1934.
189. Ann. Int. Med. 7: 812, 1934.
190. Am. Heart J. 9: 370, 1934.
191. Ibid. 9: 806, 1934.
192. Lancet. 1: 8, 1934.
193. Am. J. M. Sc. 187: 171, 1934.
194. Ibid. 188: 382, 1934.
195. New England J. M. 211, 624, 1934.
196. Lancet. 2: 923, 1934.
197. Am. J. M. Sc. 187: 23, 1934.
198. M. Clin. N. Amer. 18: 343, 1934.
199. Am. Heart J. 10: 124, 1934.
200. Ibid. 9: 792, 1934.
201. J. Pharmacol. & Exp. Therap. 50: 286, 1934.
202. Ugesk, f. Laeger. 96: 426, 1934.
203. M. Clin. N. Amer. 17: 1623, 1934.
204. Canad. M. A. J. 30: 507, 1934.
205. Ann. Int. Med. 7: 1263, 1934.
206. Quart. J. Med. 27: 381, 1934.
207. Canad. M. A. J. 31: 171, 1934.
208. Edinburgh M. J. 41: 513, 1934.
209. J. Path. & Bact. 39: 281, 1934.
210. Arch. Int. Med. 53: 741, 1934.
211. Am. J. M. Sc. 187: 149, 1934.
212. Am. Heart J. 9: 677, 1934.
213. Am. J. M. Sc. 188: 236, 1934.
214. Ibid. 188: 231, 1934.
215. Am. Heart J. 10: 248, 1934.
216. Northwest Med. 33: 189, 1934.
217. Bull. Johns Hopkins Hosp. 54: 225, 1934.
218. M. Clin. N. Amer. 17: 1569, 1934.
219. Arch. d. mal. du coeur. 27: 409, 1934.
220. J. A. M. A. 103: 553, 1934.
221. Illinois M. J. 66: 120, 1934.
222. J. A. M. A. 102: 17, 1934.
223. Ann. Int. Med. 7: 1469, 1934.
224. Am. J. Med. Sec. 187: 753, 1934.
225. J. A. M. A. 102: 2076, 1934.
226. Brit. M. J. 2: 624, 1934.

WHY MOSQUITOES CARRY TYPHOID

J. Howard Beard, M. D., and
John R. Cain, M. D.

URBANA, ILL.

In a great trial which held the front pages of Metropolitan dailies for many weeks, a quarter of a century ago, the erudite presiding judge ruled it was not important whether or not what the accused had been told was true because if it were false and he believed it, it would have the same effect as if it were the truth.

Likewise in gaining the support of the man on the street in the promotion of public health, it makes little or no difference how a disease is transmitted; the significant thing is his belief which determines the quality of his cooperation and motivates his action. The leader of the community who believes smallpox is due to filth will not advocate vaccination to eradicate the disease. Performance rarely exceeds knowledge.

To an extraordinary degree the erroneous beliefs that malaria is acquired by drinking water containing it and typhoid fever is carried by mosquitoes symbolize the superstitions and misconceptions in regard to health and indicate the inadequacy of education in hygiene. Prospective freshmen repeatedly attribute typhoid fever to

Read before Section on Public Health and Hygiene, Illinois State Medical Society, Rockford, May 22, 1935.

mosquitoes. Bonnell,[1] in a survey among high school students in four states found that 59.4% thought malaria could be acquired by drinking water from wells or cisterns that have been contaminated with it. Recently, Rhoton[2] has noted that 81% of 2,379 prospective teachers did not believe typhoid fever was caused by the typhus bacillus.

Where eight out of ten prospective teachers have so little knowledge of the cause of as well known a disease as typhoid fever, it should occasion no surprise that they should also think that character is indicated by the shape of the head, personality influenced by the planets, a broken limb healed by faith, mental disease contracted by thinking about it, or that the removal of the tonsils prevents goiter.

Numerous surveys of the knowledge of high school and college students show widespread belief in erroneous, unscientific, and dangerous health practices. Many of their prevalent beliefs are of ancient origin and have become a part of the social heritage of the race. These misconceptions have been seeded by social suggestions and religious instruction, cultivated in the soil of misinformation, and brought to full fruition under the influence of pseudo-scientific information dispensed as high-pressure advertising.

The samplings of health knowledge by Bonnell,[1] Conklin,[3] Gould,[4] Lundeen,[5] and others indicate that traditional educational agencies functioning as at present can not eliminate the superstitions and misconceptions concerning health now widely prevalent in young people who have reached our high schools and colleges, who pass as educated, and many of whom will become teachers in our public schools.

The above observers agree that their most significant findings are the great influence superstition has upon the average individual's conception of hygiene and the remarkable lack of correlations between intelligence and credulity. Lack of adequate information and the great tendency to accept fable as fact were found in a large measure to explain the health misconception so common in high school graduates.

Rhoton[2] reports that graduates from approved institutions for training teachers believe in the reliability of corns for predicting rain, of a woolen sock to cure a sore-throat, and of the toad as a cause for warts. He found evidence that commercial advertising is a fruitful source of erroneous belief concerning various aspects of health. Of the group he studied, 79% believed pain in the back is indicative of kidney trouble, 54% that the use of supports was the best treatment for weak arches, and 51% thought exercise would correct failing eyesight.

While all questionnaires and tests have their special limitations, they nevertheless provide samplings which give dependable information clearly indicative of conditions and trends. Such facts as are obtainable through them show definitely that superstition, tradition, and commercial advertising are apparently as potent at present as scientific knowledge in determining the health beliefs of high school graduates and prospective teachers.

Misconception Not Enough. We need to examine only the findings of the draft at the time of the World War, mortality rates, morbidity statistics, the incidence of avoidable ailments, and the occurrence of numerous defects in high school graduates to note with certainty the great need of health education to promote normal development, mental poise, and a sense of social responsibility.

The scourge of venereal disease, the increase and tendency of cardio-vascular-renal disease to occur early in life, the incidence of cancer, the ever-mounting casualty from automobile accidents, the widespread prevalence of dietetic insufficiency, et cetera, are conclusive proof that the only escape from preventable disease and the possibility of keeping senility beyond "three score and ten" is education which will give the individual the full benefit of available scientific knowledge.

Further prevention of physical defects and further reduction in death rates depend upon scientific fact and upon instruction by teachers with an adequate background in applied biology, chemistry, and physics. The hope of medicine, social betterment, and thrift is in the employment of such teachers. They must have training and practice in the principles of pedagogy and be able to appreciate that they have the sacred obligation to give their pupils ideals, habits, and attitudes which will keep them physically fit, mentally at their best, emotionally stable, and morally sound.

A good deal may be accomplished between the

ages of six and sixteen, but many times what parents have failed to do for their children in the first five years of life leads to consequences that the ablest physician can not undo. The golden opportunity to produce a normal physique and to lay the foundation for a well-balanced personality is pre-natal, natal, and pre-school. A well-adjusted individual is largely motivated parental knowledge.

Isolation, quarantine, and sanitation have had their epochs and still play an important role in the promotion of physical welfare and in social improvement, but public health in our complex society is personal. It is dependent upon scientific health education without which it can not obtain the cooperation of every individual and must largely fail.

The studies of Cairns,[6] the results of numerous investigations,[7, 8] and our own experience warrant the conclusion that high school graduates do not realize the significance of the common diseases of childhood. They lack appreciation of the importance of adequate nutrition, are deficient in their knowledge of the simple measures of health promotion, and often fail even to recognize conditions which produce eye strain. They do not know the essentials of sanitary environment and are unprepared to assume responsibilities in life which they will be unable to escape. A great number of them have misconceptions of matters pertaining to health which will inevitably have serious consequences for themselves and those under their care.

Health Education of High School Graduates. Recognizing the wide prevalence of misconceptions of matters pertaining to health and lack of knowledge concerning it, we have endeavored to determine as accurately as possible how much and how well effort is now being made in public school systems to provide our leading citizens of tomorrow with the information they need to preserve their health, protect their families, and to function as intelligent members of a society which grows increasingly complex and involves greater and greater social responsibility.

In our attempt to ascertain what training high school graduates were receiving in hygiene or other subjects which might give them knowledge bearing upon health we have studied the records of a total of 2,220 students. Of these, 37 or 1.6% returned questionnaires which were too incomplete to be of value in our investigation.

It will be seen from Tables 1 and 2 that only 153 or 7% of the 2,183 who furnished the data requested had had hygiene in high school and all of these were taught by teachers who were giving instruction in other subjects.

TABLE 1. SCIENCES TAKEN BY 2183 HIGH SCHOOL GRADUATES

	Number	Per cent.
Hygiene	153	7.00
Biology	1196	54.77
Physiology	480	21.98
Chemistry	1250	57.25
Physics	1336	61.19
General Science	1264	57.90

TABLE 2. FULL OR PART TIME INSTRUCTION

	Full Time		Part Time	
	No.	%	No.	%
Hygiene	000	00.0	153	100.
Biology	828	69.2	368	30.8
Physiology	230	47.9	250	52.1
Chemistry	808	64.6	442	35.4
Physics	883	66.1	453	33.9
General Science	730	57.8	533	42.2

Of the total of 2,183 prospective freshmen, 733 or 3.5% had had some hygiene or health lessons in the grammar school. It was most likely of satisfactory grade for the age of the pupils to whom it was given but obviously too elementary and too insufficient for an educated man or woman who has to live under the demands of our present civilization.

A little more than half of the 2183 high school graduates had had biology but of these 368 or 30.8% had been taught by teachers also giving instruction in some other subject. The amount of health education which high school pupils receive through biology will vary with the instructor and the text-book used, but is usually altogether inadequate for the responsibilities they will have to assume in life.

Only 480 or 21.98% of high school graduates had had physiology in high school and more than half of these were taught by teachers who also gave instruction in one or more other subjects. Where an instructor teaches several subjects, it is impossible to say in which one his primary interest lies, but as a general rule high school teachers are better prepared to teach English, mathematics, or history than either hygiene or physiology. Because physiology is the science of organic function, it is frequently taught with little emphasis upon personal hygiene, no consideration of sanitation, and no discussion of the control of communicable disease.

General science is increasing in popularity as an elective subject in high school. Of the 2183

registrants studied, 1264 or 57.9% took it in high school. This subject is usually a mixture of physics, chemistry, biology, physiology, and nutrition. As health education for high school pupils, the vast majority of whom will go no farther with their education after graduation, it offers samples of the health education they should have but is entirely insufficient to prepare them for the responsibilities they will have to assume in their homes and in their communities. Of the teaching in general science 42.2% was given by teachers giving instruction in other subjects.

Physics was taken in high school by 1336 or 61.19% and chemistry by 1250 or 57.25%. These subjects are usually taught by the same instructor who generally gives his entire time to them. In many high schools, students are required to have a certain amount of science to meet the regulations for graduation but chemistry, physics, or both are frequently considered as satisfying this requirement. It is possible, therefore, for pupils to graduate from high school without having biology, hygiene, or physiology although neither chemistry nor physics provides them with substantial knowledge of even the elements of personal and community health.

Division of Labor in the Teaching of Hygiene. An examination of Table 2 reveals that of the 2183 high school graduates studied not one of them had been taught hygiene by a teacher who gave his entire time to the subject. Of the 153 pupils who had taken hygiene only 14 received instruction in it in connection with biology or physiology. A total of 124 or 81% had been taught by teachers of physical education.

TABLE 3. SHARING OF INSTRUCTION IN OTHER SUBJECTS BY HIGH SCHOOL TEACHERS OF SCIENCE

	Hygiene	General Science	Biology	Physiology
English	2	14	13	11
Physiology	7	17	40	...
Mathematics	4	57	31	19
Physics	2	52	24	6
History	3	25	18	16
Biology	7	150	...	51
Physical Ed.	124	42	19	51
Agriculture	1	18	24	27
Physiography	2	6	4	52
Chemistry	1	52	26	...
Astronomy	...	2	...	...
Chem., Physics	...	53	10	10
Auto. Mech.	...	1	...	...
Home Ec.	...	24	3	17
Civics	...	1	1	...
Elec. Sci.	...	1	...	...
Hygiene	...	1	3	2
Bookkeeping	...	1	1	...
Manual Tr.	...	4	...	1
Soc. Science	...	1	...	1
Music	...	4	1	1
Economics	...	3	...	3
Com. Geog.	...	2	6	10
Latin	...	1	9	3
Spanish	...	1	1	...
Gen. Science	...	...	126	13
French	...	...	1	1
All Subjects	...	...	2	2
Geology	...	...	1	...
Com. Law	...	...	2	2
Geography	...	...	2	...
TOTAL	153	533	368	250

The practice of drafting whoever might be willing to attempt to teach hygiene and sanitation is clearly shown by the fact that teachers of English, mathematics, physics, history, agriculture, physiography, and chemistry were given an opportunity to instruct high school students in preventive medicine. Special training in these subjects does not provide a teacher with an adequate background to give instruction in personal and community health.

The greater part of the small group of high school graduates who have had some instruction in health education received it from their instructors in physical training usually as occasional talks on personal hygiene. Many of the athletic directors who are in charge of physical education have had elementary courses in anatomy, physiology, and hygiene. If they were permitted to give their undivided attention to health education, they should in time do as creditable work as many of the teachers of physiology or biology but they have other activities and are faced with the stern necessity of frequently producing winning teams or hunting for another job with which to support their families. Under such circumstances they are entirely too busy to give hygiene the attention its importance demands.

There are five essentials for the proper teaching of health education in high schools, namely, 1. a thorough background of the fundamental sciences of biology, chemistry, and physics, 2. knowledge of physiology, bacteriology, psychology, sociology, and economics, 3. an understanding of the principles, psychology, and philosophy of education, 4. proper facilities, and 5. an opportunity to keep up with the progress of preventive medicine and sanitary engineering which make it possible for man to control his environ-

ment more readily and to adjust himself to it.

The curricula of many colleges and universities meet the above requirements and offer the prospective teacher of hygiene an opportunity to get the background of science and pedagogy necessary to teach health to high school students who tomorrow will be determining the destinies of their communities. The demands of our complex society should obviously exclude the drafting of the educational butcher, baker, and candlestick maker to teach a fundamental subject for which they have little training but which is to provide the individual with knowledge essential to protect himself, safeguard his family, and to function as an intelligent citizen in movements for social welfare.

Until prospective teachers are required to have a proper scientific background to teach health education, are trained in the selection of subject matter and its presentation, and are employed in the public schools to teach biology, physiology, and hygiene, the public will receive only a small part of the great benefit to be derived from research paid for by taxation and by philanthropy. So long as boards of education are unprepared to provide proper instruction in hygiene in high schools, the successful practice of medicine will continue to become increasingly difficult, health administration will lack adequate financial and moral support, fads will thrive, quackery will grow more influential, and mosquitoes will carry typhoid.

BIBLIOGRAPHY

1. Bonnell, Clarence: Mistaken Notions of Scientific Phenomena as They Now Exist Among Average Citizens. School Science and Mathematics, **25**: 737-9, 1925.

2. Rhoton, Paul: Health Misconceptions of Prospective Teachers. Penn State Studies in Education, No. 5, 1932.

3. Conklin, E. S.: Superstitions, Belief, and Practice Among College Students. Amer. J. of Psychology, **30**: 83-102, 1919.

4. Gould, R. L.: Superstitions Among Scottish College Girls. Pedagogical Seminary, **28**: 203-248, 1921.

5. Lundeen, G. E., and Caldwell, Otis W.: A Study of Unfounded Beliefs Among High School Seniors. J. of Educational Research, **22**: 257-273, 1930.

6. Cairns, Laura A.: A Scientific Basis for Health Instruction in Public Schools. Univ. of California Publications in Education, **2**: 339-434, 1929.

7. Oberteuffer, Delbert: Personal Hygiene for College Students. Columbia University Contributions to Education, No. 407, 1930.

8. Reuf, Dorothy: Health Education in Senior High Schools. Columbia University Contributions to Education, No. 636, 1934.

DISCUSSION

Dr. Lloyd Arnold, Chicago: Dr. Beard and I are connected with the same university but on a different campus. I have quite a lot of contact with him dealing with the various subjects. At the time we were carrying on quite a learned correspondence on the sanitation of schools, right in the middle of it I got a letter from Dr. Beard wanting suggestions for a paper on the program entitled "Do Mosquitoes Carry Typhoid." There were three paragraphs. I read the first paragraph, and that was the sense of it. I was interrupted and laid the letter down, and picked it up again and read the paragraph again and I was again interrupted, about three times. I was wondering about it. I couldn't think why he wanted to read a paper before the State Medical Society on "Do Mosquitoes Carry Typhoid." Finally I got back and read all of the letter, or the second paragraph, and I realized that it wasn't senile atrophy of the brain at all. He went ahead and explained why he wanted just that title.

I think he has called our attention to the deficiency in our education that we all so realize. Most of us doing university work in the higher educational fields rather ignore the lack of proper instructions to the lower age levels or rather, take it for granted it is being done. From the amount of advertising that is going on in the newspapers and magazines and on the radio on health, it behooves the population to be a little critical and have some basic knowledge for evaluation.

I think his paper was well taken; I think it is very illuminating.

Table 3 has certainly placed in my mind very clearly our whole subject of hygiene, biology and physiology in our high school teaching system. I certainly hope the paper will get wide recognition. I think this subject should be directed more towards the education of the general public. It really should go to the school boards and those who are determining our educational system.

Dr. R. C. Cook, Springfield: I appreciate very much hearing this paper by Doctor Beard. It is a recognized fact that health teaching is not given the importance in the high school curriculum that it deserves.

In regard to the plan for health teaching, authorities are not altogether agreed. An article by D. C. Mitchell in October, 1934, issue of the *Research Quarterly* of the American Physical Education Association indicates that state officers and health experts (the theory group) prefer that a separate health course with four or five class periods a week for at least one year be a required course while with the practice group (active school people) there is apparently a preference for integration of the health course with the work in science, physical education, home economics, etc.

An increasing number of schools are making more use of the general science textbooks in the grades beginning with Grade 5, through Grades 6, 7 and 8.

There is very little health being taught as such to the high school pupils in Illinois because it is not compulsory. I believe there are about four states in the Union that do require one or two years of health subjects in the curriculum and give credit for some. But this is not true in Illinois, and only a very few schools give anything like an adequate course.

Another statement by Doctor Beard is, "How successfully this subject will be taugh depends upon the teacher's interest in the subject." If we go to a school

of eight or ten teachers, there may be one teacher who is quite thoroughly interested in the subject of health and will teach it in a practical way. But the chances are that a majority of teachers will be more interested in any other subject than individual and community health. We realize quite well the inadequacy with which health is taught to the pupils in a majority of high schools, but there is quite an interest on the part of the school principal in many communities to develop a school health program that will have the rating of a major subject in their curriculum. During the past year or two several school principals have undertaken to write up a health program outline and that is one thing we are particularly urging them to do, to think enough of their health program and what they are teaching to put it into print.

Dr. Elizabeth B. Ball, Springfield: I would like to add another piece of encouraging news. At the regional conference of the Progressive Education Association held in Chicago in March this year three papers on health education in high schools were presented. The University of Wisconsin High School has an excellent program and I should be pleased to send Dr. Beard a copy of this paper, should he wish to have it.

This program has been in effect long enough to produce results. The students budget their time, have physical defects corrected, make good adjustments in the social world, etc.

The paper read by Dr. Beard makes us realize the inadequacy of the health work in our high schools.

Mr. B. K. Richardson, Springfield: I would like principally to pay my compliments to Dr. Beard. I think that was one of the best papers I ever heard on that subject and certainly his data are illuminating. To those of us who have spent a good deal of time in public health work, and particularly in the educational field, it was not entirely unsuspected that this sort of educational program prevails because we recognize the general lack of information on the subject. There is one encouraging thing, I think, about the health educational picture, however. It is shown by the experience of the State Health Department through the operation of a motion picture library for a good many years now. About three years ago, I think, the Department got from the Eastman people several pictures that are particularly suitable for instruction of high school pupils. They were made under the direction of some faculty members of the Massachusetts Institute of Technology who specialize in health, and we lend those pictures. During the school season just closing now we have been entirely unable to satisfy the demands. We had four projectors that we lent along with about thirty titles of films, with multiple copies of several and all of the equipment has been reserved mostly by high school teachers for from four to six weeks in advance. We could have kept in circulation twice as many films as we have had. But it indicates to me that the interest in this subject is growing rather rapidly among teachers, which gives promise and the hope that some corrections may be made in the not far distant future in this field.

STUMBLING-BLOCKS IN INFANT CARE

SCOTT J. WILKINSON, M. D.
DECATUR, ILLINOIS

Between the simple routine problems of infant care and the major catastrophes of infancy, there exist certain disorders, which, while not necessarily serious in themselves, frequently prove to be real pitfalls in the art of pediatric practice. The various disturbances I have in mind are a source of worry, and often of dissatisfaction, to the parents,—a real barrier to successful infant supervision. Moreover, since these abnormalities are frequently troublesome for the pediatrician, it may be assumed that they are equally confusing to the doctor who does not limit his work to pediatrics. To attempt an inclusive list of problems of the nature would be pretentious regardless of the scope of this paper. The following topics, therefore, are selective on the basis of frequency and importance from a personal viewpoint.

One disturbance of this type occurs in earliest infancy. Not infrequently one encounters babies who from birth or shortly thereafter suffer from noisy breathing. Their respirations are rattly or wheezy, either continuously, or more commonly, intermittently. The breathing however is not actually obstructive, and cyanosis is absent. Eventually this type of disturbed breathing disappears spontaneously. In other respects the baby progresses normally, to the satisfaction of the doctor perhaps, but not to the parents. This syndrome, best referred to undoubtedly as congenital laryngeal stridor, must comprise one of the larger groups of so-called "enlarged thymus cases." Curiously enough, most x-ray men I have encountered are quite confident that they can and do relieve the stridulous breathing of these babies, although experience shows that the majority continue their course uninfluenced by irradiation. Congenital stridor, as a subgroup of the respiratory disturbances of infancy, is possibly itself merely a loose grouping of cases of varied etiology, for it is interesting to find that rather frequently some of these babies later develop eczema, or show definite food sensitivities. Moreover since there is a recognized association between infantile eczema and an enlarged thymic shadow, it is not surprising that an early, appa-

Read before Joint Session, May 23, 1935, at Annual Meeting of Illinois State Medical Society, Rockford.

rently confirmatory, radiogram is obtained in these so-called thymic cases. Withal irradiation is apparently harmless and quite consoling to the parents, so for the present we may be satisfied with our therapy, if not with its results. Meanwhile the parents may be safely assured that the infant will thrive and progress normally with an eventual disappearance of his troubles.

There is another bad actor among babies, more common than the so-called thymus case. This type of baby never seems to relax, and, what is worse, allows the parents little rest. By day and night they are wakeful, fretful or crying, and apparently colicky. Regardless of how well feedings are taken they frequently retain them poorly. Regurgitation or partial vomiting may occur chronically. Their restlessness and tension is entirely out of proportion to their external stimulation, and the term "hypertonic" seems to characterize them very well. Truly nothing seems to satisfy some of them, for variations in the type or strength of feedings, or in the relative fat or carbohydrate content, make little difference in their behavior or rentention of food. Interestingly enough, in spite of their apparent lack of rest, their fussing, crying, and regurgitation, they often continue to grow at quite a normal rate, providing feedings are adequate. Occasionally, in fact, they gain at a much greater rate than the average. While Vitamin B therapy has been highly recommended for this type of baby, I have found its results generally disappointing. Symptomatically sedation and adequate caloric feedings seem to give the best results. Among the causes of this disturbance there may well be constitutional factors, for often the baby mirrors traits quite evident in the nervous, high strung parent. Here again, as in some of the babies with respiratory disturbances, later signs of allergy may develop, suggesting a latent source of trouble present from the time of birth. As in the first group, time mollifies the symptoms, and here too the anxious parents can be confidently promised a more normal infant at a later age.

The behavior of these so-called "hypertonic" babies introduces another problem in infant management—the question of underfeeding. It does not seem illogical, in the presence of the apparent colic and persistent regurgitation of the hypertonic baby, to dilute the prescribed formula because of the suggested indigestion. Actually, as mentioned above, this particular type of baby does better on a relatively rich feeding. With dilute formulas and an increase quantitative intake resulting from hunger, vomiting of this type becomes worse. This same inability to retain total volume desired is occasionally seen in otherwise normal infants on very dilute formulas. Too frequently also, progressive dilution of formulas may be practiced for misinterpreted symptoms other than vomiting. Fussiness or loud crying, early or late, after breast or bottle by no means implies indigestion, or improper feedings. The presumption should be hunger, and improvement should not be sought primarily in dilution or variation of the formula. While an occasional baby with low fat or carbohydrate tolerance is seen, the older conception of fat, carbohydrate, or protein indigestions per se is rarely encountered. Such ideas, however, have contributed to a great deal of formula tinkering which reaches its worst stages where the feedings are altered every few days without giving the infant a real chance to prove his response to the current formula. With dilute feedings and rapid changes of formulas uniform stools cannot be expected, but the resultant green or variable stools may be misinterpreted as additional signs of indigestion. In addition to misjudgment of infant behavior, there is another important factor that has contributed largely to the practice of underfeeding. I refer to the questionable belief, which is widely prevalent, that the average gain in early infancy of 4 to 6 ounces weekly is normal or satisfactory for all babies. Many babies will be strikingly hungry, and therefore presumptively underfed, on formulas permitting such a gain. With more liberal feedings on the other hand, gains of a pound a week in perfectly contented babies are not uncommon in early infancy. While such gains are not maintained regularly, these babies often double their birth weight before the third month rather than the frequently quoted 5th to 6th month. The question of overfeeding which might be raised here should be sufficiently answered by the perfectly normal development of these infants, and, what is more significant, by the comparable growth of some breast-fed infants. The present day science of nutrition has not yet answered all of the practical problems of infant dietetics. An excellent example of this is found in a proprietary infant food scientifically con-

structed to duplicate breast milk as closely as possible in a chemical and physical fashion. In spite of its theoretical advantages I have yet to encounter a baby who has been satisfied on this particular feeding, or who has apparently developed as well as might be expected from the nutritional standpoint. Conversely, I do not think there is any doubt but what the success and popularity following the use of lactic acid feedings has been based more on the practical results of a confidently prescribed, rich caloric feeding rather than on the theoretical advantages of this particular mixture.

The underfed baby has his counterpart in another infant behavior problem—the child with anorexia. A scanty appetite may mean many things to the physician; to the parents it is a disease in itself, and one of no little consequence. As doctors, we will be reassuring to the parents to the degree that we appreciate the normal variations of appetite in infancy, which after all are probably not greatly different from the fluctuations at other ages. The occasional baby who thrives on quite a low caloric intake amends for his dainty eating, as far as the parents are concerned, by his satisfactory gain and growth. It is worth noting in passing, however, that the mentally retarded child is not uncommonly a very difficult one to feed and obtain satisfactory development. The anorexia that distresses parents, though, usually occurs in perfectly normal babies. Characteristically this anorexia is never a constant symptom. As a matter of fact the normality of these variations is established by the transient, relative, or variable nature of the anorexia. An example of this misinterpreted, so-called, anorexia is encountered not infrequently during the last half of the first year. A healthy infant who hitherto has been regularly hungry at feeding time rather gradually, or perhaps abruptly, slumps in his quantitative diet to a striking degree. This period of noticeably lessened intake may persist for several days, or even weeks. In spite of the parents' suffering the baby usually appears happy and contented, fever or signs of infection are absent, and in all other respects he behaves quite normally. Possibly this variation is an adjustment to the slower rate of growth during the second six months. Teeth are also erupting at this age and in some babies the coincidence of the lowered appetite and swollen gums is striking. While many babies cut their teeth with no evident disturbance, careful observation will show the most varied and bizarre symptoms occurring in some infants during the stage of tooth eruption. A more common age period for the appearance of these so-called anorexias is the second year of life. Here there can be no doubt but that the decreased appetite and lessened intake is in keeping with the slower rate of growth. The parents, nevertheless, are greatly concerned when they see the hub of the household eating less at 18 months than he did at 8 months. The particular foodstuff rejected varies. It may be chiefly milk, or perhaps the cooked cereals, or vegetables. Inquiry as a rule reveals that the baby is taking some food with relish, possibly starches as toast and potatoes, and proteins as meat or eggs. Not uncommonly the mother may be voluntarily restricting the desired quantity of meat for lurking fears or possible kindney damage. Experience has uniformly shown that at this age nothing is more important for the child's eating habits and appetite than studied indifference as to the total quantity or exact variety of food taken. Provided that a certain variety of natural foods are offered at regular intervals, only good results may be confidently expected if the infant is granted the privilege of starting to lead his own life. Frequently at this age, however, three outstanding faulty practices are mistakenly initiated. First, intermediate feedings are started to bridge the supposedly serious gap between light meals; second, sweetened, flavored carbohydrate foods are given because they are taken more readily, and third, meals are forced, bribed, or cajoled into the unwilling child. All three practices merely pervert the natural appetite, intensify the apparent anorexia, and may, therefore, eventually seriously interfere with the child's nutrition. Back of the parent's anxieties and this unnatural feeding are at least three current shibboleths of nutrition—calories, vitamines, and minerals. The widespread publicity along dietary lines in infant welfare has merely served to divorce practice from theory as far as infant nutrition is concerned. As a matter of fact, it is quite impossible for the physician himself, even under ideal conditions, to keep any baby's diet constantly balanced against known theoretical requirements. With rational guidance of diet and eating habits, how-

ever, the dietary requirements of the infant may be adequately balanced over longer periods of time. The scientific proof for such a statement may be found in the careful, extended, studies of Dr. Clara Davis in her experimental work on self selection of diets in infants and children. Briefly, she allows children to choose their own variety and quantity of natural foodstuffs in a perfectly neutral atmosphere as far as the child's behavior is concerned. Her principles of feeding by reason rather than by rule are applicable in actual practice with intelligent, cooperative parents, economically able to provide for their children. Over a period of several years I have followed numerous children fed according to Dr. Davis' principles of self selection. The temporary vagaries and transient variations in food intake in these children in their homes duplicate the experiences of Dr. Davis under controlled conditions. All of the children have developed normally and are of exceptionally good nutritional status. Moreover none have ever shown any real or prolonged poor appetite, and feeding has never been a problem. This volitional method of feeding is apparently both sound and practical to the extent that the cooperation of the parents may be obtained.

Any discussion of the problems of infant care can scarcely avoid the question of infections. Infants, like the rest of mankind, are victimized chiefly by the varied and repeated respiratory infections. However, I think it is interesting to notice that the so-called common cold is quite unusual during the first year of life. The alleged colds of infants, marked by nasal discharge, sneezing, or coughing, have in my experience usually been associated with pale puffy mucous membranes more suggestive of allergic reactions than of primary infectious changes. That allergic phenomena must not be overlooked merely because of the tender age, is shown by the typical attacks of asthma which may be encountered even within the first few weeks of life. The triad of respiratory complications which ferquently cause the most severe illnesses in infancy—otitis media, pyelitis, and pneumonia—have been stressed many times before, and I merely mention them as diagnostic problems quickly disposed of by the otoscope and indicated laboratory examinations. Likewise the common contagious diseases are rarely diagnostic problems in infancy, since exposure is ordinarily familiar. One disease, however, deserves special comment. I refer to the condition variously called roseola infantum, erythema infectiosum, exanthem subitum, critical preeruptive fever, and Duke's 4th disease. Although its existence has been questioned by some, observation will show that, clinically, it is apparently the most consistent of all the acute infectious diseases of infancy. Starting acutely with fever, malaise, anorexia, irritability or drowsiness, the illness runs with monotonous uniformity for a period of about 4 days. During this time the temperature and degree of malaise fluctuate. Characteristically and pathognomonically, physical examinations during this time reveal perfectly normal findings. Terminally, the second typical feature of the disease appears—a fine rash of variable intensity, frequently not unlike the eruption of German measles. With the appearance of the rash the fever breaks by crisis, and symptomatic recovery is complete although the rash may persist for 24 to 48 hours. Complications do not occur. The only condition which might simulate this illness is the subacute type of upper respiratory infection featured by fever and generalized symptoms out of proportion to the visible changes in the nose and throat. Roseola infantum is probably quite common in infancy. In obtaining histories of infantile upsets, it is probably spoken of as multiple attacks of measles, or so-called teething or feeding rashes of transient duration. Careful questioning of the mother will often elicit the story of a protracted, solitary, fever terminated by a rash. In the presence of the illness, the rather prolonged febrile course with no evident cause is frequently alarming to attentive parents who may easily feel that all is not going well. If roseola infantum is remembered it will be recognized, and if anticipated the parents may frequently be reassured in the midst of this harmless infantile upset.

In conclusion, as exemplified by roseola infantum, it might be said that the troublesome problems of infant management often do not involve serious or spectacular diseases. On the contrary many of these perplexing problems concern self-limited or benign conditions. For the reassurance of the parents, nevertheless, and for rational treatment, it is important that these conditions be recognized. This implies chiefly a proper interpretation of infant behavior. Some

typical problems of this nature have been presented. To epitomize:

1. Beware of the diagnosis "thymic case."
2. Remember the non-conformist "hypertonic."
3. Appreciate the signs of hunger and underfeeding.
4. Use common sense as well as current science in infant dietetics.
5. Include roseola infantum in the acute infectious diseases of infancy.

GASTRIC SECRETION IN BILIARY TRACT DISEASE

FREDERICK STEIGMANN, M. D.
Resident in Medicine, Cook County Hospital,
CHICAGO

In 1893, Leva[1] first pointed out that the secretion of the stomach is changed in diseases of the liver and gall bladder. Later (1900) Pawlov,[2] Bickel,[3] Cohnheim,[4] and Sato,[5] have shown that the contents of the duodenum influence the amount of secretion of gastric juice. Clinically it has been known for a long time that patients suffering from gall bladder disease complained also of gastric symptoms. These latter were interpreted as due to the changes in the bile which by producing alterations in the duodenal contents give rise to disturbances of the gastric secretion.

The problem of gastric secretion in cases of cholecystitis and cholelithiasis has been controverted for a long time. Some authors (Hohlweg)[6] are of the opinion that a deviation from the normal of the gastric secretion without any actual stomach findings is due to the disturbances in the biliary system. Others, like (Aldor)[7] believe that the secretory deficiency of the stomach is primary and the cholecystopathy secondary. A number of years ago Aldor stressed the importance of decreased gastric secretion in the etiology of the gall bladder disease by calling attention to the fact that the anacidity or subacidity may lead to a possible infection of the biliary system. Aldor also observed in more than half of his gall bladder patients a marked increase in the gastrogenic mucus similar to the increase of mucus in chronic gastritis. He, therefore, opined that the dyspeptic symptoms and the lowered acidity may be the simultaneous expression of both a primary gastritis and a secondary cholecystitis or cholelithiasis.

Much clinical and experimental investigation has been done in this field, but the opinions concerning gastric secretion in gall bladder disease are still quite divergent. Thus, Hohlweg (1912) examined forty-two cholecystectomized patients and found in 69% anacidity, in 14.3% subacidity and only in 16% normal value. Through clinical observations and experiments on animals, Hohlweg found a decrease or nearly complete loss of gastric secretion following the loss of the gall bladder function, as caused by occlusion of the cystic duct or shrinking of the gall bladder. Aldor[7] found 42.6% anacidity and subacidity among his material of gall bladder pathology. Rydgaard[8] in collecting 471 cases from the literature, noted that 52% of them had a hypoacidity. In Rovsing's[9] clinic, out of 158 cases of cholecystitis 47.4% showed lowered acid values. Gatewood[10] found 45%; Dittmann,[11] 50%; Ohly,[12] 47%; and Boss,[13] 56% anacidity and subacidity in patients with gall bladder disease. Higher percentages of decreased gastric acidity in their gall bladder material are reported by Loess[14] (64%), Moewes[15] (67%), Miyake[16] (69%), Landgraf[17] (67.5%), Gulecke[18] (70%), Dangschat[19] (73%), Rohde[20] (74%), Akaiwa and Sugano[21] (77%), Behm[22] (85%), Schneider[23] (85%), and Cohn[24] (87%). Following cholecystectomy changes in the gastric secretion were in general not significant. Only Dangschat,[19] Behm[22] and Rohde[20] report an increase in the preoperative percentages of subacidity of 3.2%, 14%, and 15% respectively.

On the other hand a number of authors not only deny the co-existence of lowered acid values with gall bladder disease, but claim that hyperacidity is frequent in these cases. Magnus,[25] Miyake,[16] and Boss,[13] maintain that there is no connection between subnormal gastric acidity on the one hand and gall bladder disease on the other hand, though Boss,[13] and Miyake,[16] found decreased acid values in more than half of their patients with gall bladder disturbances. Lantodub[26] reports that in his material, diseases of the gall bladder were associated more often with normal acidity or hyperacidity. He believes that the decrease in acidity is not the infallible result

From the Department of Medicine, Cook County Hospital.

of the cholecystopathy, but that it may be due to some associated or co-existent affection of the gastrointestinal tract or of any other part of the organism. Koch[27] reports 61.9%, and Emura[28] 45.9% of hyperacidity among his series of gall bladder cases. Hyperacidity was also observed by Kern,[29] Grube,[30] and Kraft.[31] Simnitzky,[32] in contrast to Hohlweg[6] found that complete cessation of the bile flow was associated with an increase in the acid values of the gastric secretion. Lehmann[33] reports hyperacidity in cases of cholecystitis of short duration, while subacidity or anacidity was present in chronic cases. This finding is in agreement with that of Lueders and Scherer.[34].

On the basis of the above quoted material it is pertinent to state that the relation existing between gall bladder disease and stomach secretion is not an unimportant one. In fact, the physiological relations between the gall bladder (biliary system) and the stomach are probably multiple and of practical nature. That these relationships, although known, are not fully evaluated is due to the variable interpretation given by the different authors to the experimental results and clinical observations. With this in mind, it was deemed appropriate to study the gastric secretion in a number of cases with disturbances in their biliary system, and to determine which one of the above quoted theories would be applicable to our group.

The investigation was done on a group of eighty patients with gall bladder disease, who had entered the Medical Department of the Cook County Hospital in the first half of 1933. The patients included in this group were considered positive cases of gall bladder disease because of 1. history of dyspeptic disturbances with or without colics; 2. findings of tenderness in the right upper quadrant; and 3. roentgenographic findings of either (a) non-visualization of the gall bladder, (b) non-emptying of a well filled gall bladder; or (c) stones in the gall bladder, after the oral administration of tetraiodophenolphtalein (Gall bladder dye). Doubtful cases were not included. In thirty patients the diagnosis was checked by an operation. Of the eighty patients, sixty-four were women and sixteen were men. In five cases there was an associated pathologic condition. One case had a previous gastroenterostomy for a duodenal obstruction, one coronary disease (checked by an electrocardiogram), one an enlarged right kidney, one a stone in the right kidney, and the last one a cirrhosis of the liver

The examinations of the gastric contents were done as follows: The patient received the usual Ewald meal in the morning. One hour later the stomach was aspirated and the contents were tested for free acid with Topfer's solution (0.5% alcoholic solution of dimethylaminoazobenzol), and for total acidity with a one per cent. alcoholic solution of phenolphtalein. A free acid of twenty to forty degrees and a total of forty to sixty was considered as normal secretion); above forty degrees free acid as hyperacidity; below twenty degrees of free acid as subacidity; and without free acid as anacidity. In most of the latter cases a fractional test was done using a seven per cent. alcohol solution and 1:1000 histamin solution as the test meal. The technique used was as follows: A Rehfuss tube was introduced into the fasting patient's stomach, and the contents were aspirated and tested for free and total acid. With the Rehfuss tube in place, 240 cubic centimeter of a 7% alcohol solution were given the patient orally. Fifteen minutes later, the stomach contents were aspirated and were tested for free and total acid. Then ½ c.c. of a 1:1000 solution of ergamin acid phosphate (histamin) was injected subcutaneously and the stomach was aspirated every fifteen minutes for one hour. Each aspirated specimen was tested for the degree of acidity and the highest reading obtained was taken as the final degree of free and total acid.

Result. Of the eighty patients examined, thirty or 37.5% showed normal acidity; five or 6.2% hyperacidity; thirty-one or 38.7% subacidity; and fourteen or 17.5% anacidity. This makes a total of 56.2% of hypacidity. Of the fourteen cases with anacidity, ten were given an alcohol histamin fractional test. Of these so tested patients, six showed free acid on histamin but not on alcohol, while four patients did not show any free acid on either test. Among these latter four cases, one was found at operation to have a cirrhosis of the liver. A constant finding in the cases with anacidity was the large amount of gastrogenous mucus in the aspirated stomach contents. The mucus was so profuse and tenacious that the filtration of the aspirated specimens was very slow and tedious, often taking four to

six times the length of time required by normal gastric contents.

Curiously enough, but coinciding with the findings of other workers (Aldor, etc.), the age of the patient or the duration of the symptoms did not seem to have any relation to the gastric acid values. The age incidence of the patients with normal acid values was nineteen to sixty years, with an average of forty-three years. The ages of the subacidity group and of the anacidity group were from twenty-one to sixty and twenty-eight to sixty-one respectively with an average of forty-three years in both groups. The ages in the hyperacidity group varied from thirty-three to seventy-two years with an average of fifty years. The duration of the symptoms referable to gall bladder disease was on the average two and three years respectively in the group with subacidity, anacidity, and one and a half and three years in the hyperacidity and normal groups respectively. (Table 1.)

Comment. It was not within the scope of this study to prove or disprove whether the decreased gastric acid value is primary and the cholecystopathy secondary as Aldor and others claim, or whether disturbances in the gall bladder lead to a decrease of gastric secretion as Hohlweg believes, but only to find whether there is a decrease of the level of the gastric acidity in patients with gall bladder disease. The finding of a lowered gastric acidity in 56% of our cases is in agreement with the results obtained by the majority of the workers and seems to support the theory that there is a decreased acid secretion in patients with gall bladder disease as compared to normal individuals. Our results, furthermore, seem to corroborate Aldor's theories that there is an associated chronic gastritis in cases of cholecystitis or cholelithiasis or both. These conclusions appear justified in view of the high percentage of cases with decreased gastric acidity and in view of the marked increase in gastrogenous mucus. Then too, the fact that of ten patients with anacidity four did not show any free acid even on the histamin fractional test, speaks for an involvement of the gastric mucosa proper.

Contrary to Rydgaard, Dangschat and Rohde's findings, the occurrence of stones in the gall bladder, cystic or common duct, did not seem to influence the acid values in this group. In the twenty patients in which gallstones were found at operation, there was an about proportional incidence of hypacidity on the one hand and normal acidity on the other hand (Table 2). The acid values in three patients in which a stone was found in the cystic duct were 59°, 8°, and 10° respectively, while one patient with a stone in the common duct had a free acid of thirty-four degrees. Rydgaard's observation that icterus is no criterion of the level of gastric acidity was noted in this series, too, with jaundice occurring in only twelve patients and being distributed in the various acid value groups. Hine's[35] theory that achlorhydria interferes with cholecystography which was refuted by Dewey,[36] Lockwood[37] and others could not be proved or disproved in this series, since of fifteen patients with a non-visualization of the gall-bladder and anacidity only four were operated on, but in these four there was an actual pathologic process in the gall-bladder sufficient to cause a non-visualization. In general there was a close agreement between the clinical and roentgenologic findings, except in regard to cholelithiasis which was diagnosed roentgenologically twice but found in twenty cases at operation. (Table 3.)

SUMMARY

1. Decreased gastric acidity was found in 56.4% of patients with gall bladder disease observed in this series. The diagnosis of cholecystopathy was made by history, physical findings, cholecystography (oral dye administration), and in thirty cases confirmed by operation.

2. The duration of symptoms, the age of the patients, the occurrence of stones in the gall-bladder, cystic or common duct, and the presence of jaundice appeared to be without influence upon the degree of acid values of the gastric secretion.

3. A chronic gastritis seems to be present in the cases with marked subacidity and in those with anacidity as evident by the increase of gastrogenous mucus.

4. Ten out of fourteen cases with anacidity had alcohol-histamin fractional test and of these only six showed free acid.

5. The finding of hypacidity in a patient with upper abdominal symptoms and without any findings in the stomach should be highly suggestive of gall bladder disease.

I wish to express my sincerest gratitude and deepest appreciation to Drs. L. C. Gatewood and

Frederick Tice for their suggestions and valuable assistance in the preparation of this paper.

4258 West Harrison Street.

	Age of Patient			Duration of Symptoms		
	Oldest	Youngest	Aver.	Longest	Shortest	Aver.
Gast. Secr.	Pat.	Pat.	Age	Durat. Yrs.	Durat. Mos.	Durat. Yrs.
Hyperacidity	72	33	50	3	4	1½
Norm. Acidity ..	60	19	43	16	3	3
Subacidity	60	21	43	8	3	3
Anacidity	61	28	43	10	6	3

1. Table showing relation of age and duration of symptoms to degree of gastric acidity.

	Number of Cases							
	Diagnosis Clinically and Operatively			Diagnosis Clinically and not operatively				
Type of Gastric Acidity	with stones	without stones	Total	with stone	Non-Visual. Viz.	not empty	Total	Total of Series
Hyperacid. ..	2	0	2	0	3	0	3	5
Norm. Acid .	7	2	9	0	21	0	21	30
Subacid.	9	6	15	0	15	1	16	31
Anacid.	2	2	4	0	10	0	10	14

2. Table showing number of cases operated and non-operated in the various acid groups.

	Number of Cases					
	Cholecystitis and			Miscellaneous		
Diagnosis made	Cholecystitis	Cholelithiasis	Cholesterosis	Perfor of G. B.	Quest. Path.	Total No.
Clinically and on X-ray	28	2	0	0	0	30
Found Surgically.	6	20	2	1	1	30

3. Table showing agreement of clinical and surgical diagnosis.

BIBLIOGRAPHY

1. Leva, J.: Uber das Verhalten der Magenfunktionen bei verschiedenen Leberkrankheiten. Virch. Archiv., **132**: 490, 1893.
2. Pawlow: Quoted by Akaiva and Sugano.
3. Bickel: Quoted by Akaiva and Sugano.
4. Cohnheim: Quoted by Akaiva and Sugano.
5. Sato: Quoted by Akaiva and Sugano.
6. Hohlweg, H.: Uber Storungen der Salzsäureabscheidung des Magens bei Erkrankung und nach Extirpation der Gallenblase. Deut. Archiv f. klin. Med., **108**: 255, 1912.
7. Aldor, L.: Der Magenmechanismus der Gallensteinkranken, etc. Arch. f. Verdaumgskrank., **35**: 10, 1925.
8. Rydgaard, F.: Cholelithiasis and Achylie Arch. f. klin. Chir., **115**: 511, 1921.
9. Rovsing: Quoted by Rydgaard from Pathogenie de Calculs Biliaries et Indications Operataries, 1925.
10. Gatewood: Achlorhydria in Gall Bladder Disease. J. A. M. A., **81**: 904, 1923.
11. Dittmann, G.: Untersuchungen uber die Leberfunktion und die Duodenal- und Magensekretion bei Erkrankungen der Gallenwege. Beitr. z. klin. Chir., **129**: 507, 1923.
12. Ohly, A.: Uber die Säurewerte des Magens bei Cholezystopathie. Arch. f. Verdaungskrank, **45**: 239, 1929.
13. Boss, W.: Gallenblasenerkrankung und Magenfunktion. Beitr. z. klin. Chir., **127**: 163, 1923.
14. Loessl, J.: Gallensteine und Magensekretion. Deut. Zeits f. Chir., **193**: 325, 1925.
15. Moewes, C.: Uber Lebererkrankungen und Magensaftsekretion. Deut. Med. Wchnsehr., **48**: 588, 1922.
16. Miyake, H.: Statistische, Klinische und Chemische Studien zur Atiologie der Gallensteine. Arch. f. klin. Chir., **101**: 54, 1913.
17. Landgraf: Quoted by Loessl.
18. Gulecke, N.: Die chirurgische Behandlung des Gallenstein-leidens. Med. Klink., **24**: 241, 1928.
19. Dangschat, E.: Der Einfluss der cholelithiasis und der Cholezystectomie auf die sekretorische Funktion des Magens und Duodenums. Beitr. z. klin. Chir., **128**: 605, 1923.
20. Rohde, C.: Untersuchungen uber die sekretorische Funktion und das roentgenologische Verhalten des Magens und Duodenums bei Cholelithiasis. Arch. f. klin. Chir., **115**: 727, 1921.
21. Akaiwa, H. & Sugano, D. M.: The Incidence of Hypoacidity in Cholelithiasis and Cholecystitis. Ann. of Surg., **90**: 415, 1929.
22. Behm. M.: Uber die Störungen der Salzsäuresekretion des Magens bei Erkrankungen des Gallenblase. Deut. Med. Wchns., **47**: 993, 1921.
23. Schneider: Quoted by Loessl.
24. Cohn, G.: Uber das Verhalten des Magen—und Duodenal saftes zur Gallensteinerkrankung. Arch. f. klin. Chir., **127**: 306, 1923.
25. Magnus, G.: Gallenblase und Magenmechanismus. Med. Klinik., **9**: 1078, 1913.
26. Landodub, J. E.: Die Magensekretion bei Cholezystopathien. Arch. F. Verdauungskrank., **49**: 347, 1931.
27. Koch: Quoted by Loessl.
28. Emura: Quoted by Loessl.
29. Kehr, H.: Uber einige zurzeit besonders. "aktuelle" Streitfragen aus dem Gebiet der Cholelithiasis. Ergeb. d. inn. Med., **13**: 198, 1914.
30. Grube: Quoted by Loessl.
31. Kraft: Quoted by Loessl.
32. Simnitzky, S.: Uber den Einfluss der Gallenretention auf die sekretorische Thätigkeit der Magendrüsen. Berl. klin. Wchns., **38**: 1077, 1901.
33. Lehmann, G.: Beiträge zur Klinik der Cholelithiasis. Med. Klinik., **17**: 67, 1921.
34. Lueders, C. W. & Scherer, L. R.: Gastric Acidity in Relation to Biliary Tract Disease. Am. J. of Surg., **11**: 280, 1931.
35. Heines, L. E.: Cholecystography in the Presence of Archylia Gastrica. J. Am. M. A., **90**: 2099, 1928.
36. Dewey D. & Talley, D. D.: Cholecystography and Gastric Anacidity. J. A. M. A., **92**: 110, 1929.
37. Lockwood, I. H. & Skinner, E. H.: Cholecystography. Radiology, **11**: 7, 1928.

VETERANS' MEDICAL LEGISLATION AS IT AFFECTS THE MEDICAL PROFESSION

E. H. Cary, M. D.

Past President of the American Medical Association,
Chairman of Committee on Veterans' Affairs.

DALLAS, TEXAS

Mr. Chairman, Ladies and Gentlemen: The thought has been running through my mind as to what in all probability would appeal to the doctors who have done their duty, who have been in the service of their country, those of you who have not only done that but who were sufficiently trained to become doctors before you had an opportunity to do something for your country, and were imbued with all the traditions of

---

Extemporaneous Remarks presented at Veterans' Service Committee Dinner, Eighty-fifth Annual Meeting, Illinois State Medical Society, Rockford, May 21, 1935.

your profession. I realize as you do that you are after all, first a doctor, that you recognize the importance of the profession and the value of that unity which exists within the medical profession, which sustains its ideals and will protect it from the future trouble which may come.

I recall just a few years ago when many demands were being made upon the country to take care of that group of disabled soldiers, everyone, including all the doctors, cooperated in seeing that every disabled soldier of the United States was promptly and properly cared for, not only with hospitalization but with compensation. It was soon found by the doctors who had gone back into their respective districts to practice medicine, that legislation for disabled soldiers meant increased hospitalization; that increased hospitalization pretty soon meant a hospital growth in this country far beyond the needs or demands of those who were disabled in the War. The medical profession watching that, became somewhat solicitous of the future. We were not unaware of the history of medicine as it is practiced in all the countries of the world. We were aware of the complications that follow in the wake of too much governmental interference. Following that thought, it was not difficult for the medical profession to become somewhat aroused as to the tendencies or outlook of the future; what would happen if every congressman in this country would try to have a hospital as large, as beautiful, as expensive, as the congressman in some other district. It looked for a time as if this might be true. Of course, the medical profession had a word to say about it, and the American Legion had a word to say about it. Before a great while the medical profession was being misunderstood by the American Legion and correspondingly, the Legion was misunderstood by the profession. Not very long ago, in 1931, some of the wisest men in the Legion saw that they had to seek some cooperation or consultation which might lead to an understanding. In Washington, in 1931, a committee, with representatives from the American Medical Association and the American Legion got together and tried to find out what they were driving at and where it would lead.

In a very short time, it was concluded that there was first, an acute genuine need, a growing need in all probability as far as the government was concerned, to take care of those soldiers who had or who might develop tuberculosis. It was discovered in this conference that there would be, soon, a need for hospitalization for nervous and mental cases. It was readily agreed that we as medical men could support the efforts of the Legion to take care of these soldiers who were not normal mentally and who could not care for themselves, and those veterans who as time went on, could not be cared for by their families and could be better cared for by the American government. In having come to a fine spirit of understanding and cooperation by this conference, we were able to take the next step.

Later, we were invited to attend the American Legion meeting at Portland. There I had the honor, as President-elect of the American Medical Association, and as a member of the Veterans' Service Committee, to meet the men of the Legion and General Hines, and to have conferences which finally brought about a better understanding between the Medical Profession and the American Legion. As time has passed we have been able to have these various conferences and meetings, and we have come to know just how far the Legionnaires of the country desire to go in the matter of hospitalization, and just how medicine will be affected by it.

Hospitalization has not been the only question, of course. There have been many other points involved, particularly the question which Doctor Mosley discussed a moment ago, as to how much the Legionnaire who was not in need would use the privilege, which is his, of going to a distant point for hospitalization instead of remaining in his own community and letting his own doctor care for him. I recall when Doctor Woodward and I had met with the Committee representing both Houses of Congress and had the opportunity of speaking concerning the beds in the ordinary hospitals of this country. At that time something like 200,000 beds were vacant. It was quite evident that this particular factor had never appealed to the Congressmen. It has never been hard to find from those who lead the American Legion some basis of understanding, where they are willing to protect the medical profession and to take care

of the various details which I have already mentioned. So you see we have gone a long way to try and reach a basis by which the medical profession could be cared for and protected, and by which the future of medicine in this country would be protected and by which the country would not be over hospitalized.

We became deeply interested in a conference which took place in Chicago, wherein was discussed the four points which were brought out by the distinguished gentleman of Illinois, the Commander of the American Legion, as his program. We were greatly interested in one feature of that program. We were wondering just how this non-service connected disability clause would be received. We found that the Legionnaires were not interested in free hospitalization for men who could pay, and that they were perfectly willing to have enforced the oath which applicants for hospitalization must sign, and which carries a $5,000 fine and jail sentence for false statement. What has happened? Today there are 3,000 beds vacant in sanatoriums used for tuberculosis. There are 6,000 beds empty in general medical hospitals. We have had an economic breakdown and a terrible depression, so we would have expected more men to use government hospitals, leaving their country doctors; and they would, had it not been for the restraining oath. The result is that hospitalization benefits are not being abused today. We realize that there is no need for new hospitals, because we know throughout the country there are something like 200,000 vacant beds in voluntary hospitals.

We have reached a point of understanding with the American Legion where we gladly concede the right of the government to make provisions for all nervous and mental cases. This is all right. When a flood of hospital bills went into Congress recently, I took a committee down there. We found the rights which we had established through understanding and friendship were holding, that there was no effort being made to force construction of new hospitals. Seemingly, any new additions will be along logical lines, which will not affect the medical profession adversely. So, gentlemen, I think we have been able to bring about a happy situation for the men here and there who have given unstinted service when their country was in need, and who could not have served their country so well if they had not had medical training. If you men had not been there to support the soldiers, to care for the sick and wounded, and to bring them to a stage of convalescence where they could be brought home, certainly the veterans would not have fared so well. The medical profession did its duty as it always has done, without thought of reward. The medical profession, through its cooperation with the Legion and through such men as Doctor Fredrickson and Doctor Williamson in this state, has been able to gain an understanding which will enable us to keep from this country that type of practice which will destroy the private practice of medicine, and which will enable the profession to do more than stand still; and keep it from distintegrating into forms of practice which have been used in other countries, but that is another story. I would like to tell you something of what is being accomplished along that line. I would like to tell you something of the future prospects of medicine. All I will say is that if medical men will stand together in the next two years, as they have previously, I believe the proposed policy of governmental practice of medicine will be put aside. It is for us to stand pat, to stand unified.

ILLINOIS HOSPITALS

(Continued from Page 116)

Minonk, 1,910—Woodford								
Fisher Hospital	Gen	Indiv	9	2	No data supplied			
Woodford County Tuberculosis Sanatorium	TB	County	11	..	..	..	7	
Mooseheart, 1,519—Kane								
Mooseheart Hospital	Chil	Frat	80	..	..	51	2,079	
Mt. Prospect, 1,225—Cook								
Mt. Prospect General Hospital	Gen	Corp	20	4	10	1	100	
Normal, 6,768—McLean								
Soldiers' and Sailors' Children's School	Inst	State	25	..	..	15	2,000	
Paxton, 2,892—Ford								
Paxton Community Hospital	Gen	NPAssn	16	4	23	6	224	
Peoria, 104,969—Peoria								
Peoria Isolation Hospital	Iso	City	50	..	..	..	5	
Pontiac, 8,272—Livingston								
Illinois State Reformatory Hospital	Inst	State	38	..	..	22	694	
Quincy, 39,241—Adams								
Illinois Soldiers' and Sailors' Home and Hospital	Inst	State	248	..	..	121	870	
St. Charles, 5,377—Kane								
St. Charles School for Boys	Inst	State	30	..	..	19	640	
Savanna, 5,086—Carroll								
Station Hospital	Gen	Army	10	..	..	3	120	
Sullivan, 2,339—Moultrie								
Illinois Masonic Home	Inst	Frat	41	..	..	85	40	
Urbana, 13,060—Champaign								
McKinley University Hospital	Inst	State	85	..	..	28	1,410	
Wedron, 202—La Salle								
St. Joseph's Health Resort	Conv	Church	60	..	..	30	570	
West Chicago, 3,477—Du Page								
Country Home for Convalescent Crippled Children	Orth	NPAssn	120	..	..	97	214	
Wheaton, 7,258—Du Page								
Howe Home	N&M	Part	15	..	..	8	1	
Mary E. Pogue Sanitarium	N&M	Indiv	40	..	..	..	..	
Wheaton Health Resort	Gen	Part	30	12	14	7	49	
Wheeling, 467—Cook								
Wheeling Hospital	Gen	Indiv	9	5	12	2	140	
White Hall, 2,928—Greene								
White Hall Hospital	Gen	Indiv.	6	5	81	6	289	

Winnetka, 12,166—Cook
North Shore Health Resort.. Conv Corp 75 .. .. 50 ..

	Number	Beds	Average Patients	Patients Admitted
Hospitals and sanatoriums.....	264	59,770	47,055	486,107
Related institutions	56	10,156	8,633	20,285
Totals	320	69,926	55,688	506,392
Refused registration	41	1,391		

PARATHYROID HORMONE THERAPY

Joseph C. Aub, Boston (*Journal A. M. A.*, July 20, 1935), states that the chief therapeutic value of parathyroid extract is dependent on its influence on the blood levels of calcium and phosphorus. Its major use, therefore, lies in the treatment of acute low calcium tetany. In this condition it may be a life saving measure. Parathyroid extract may also be chosen for other therapeutic purposes. In these less urgent conditions, its beneficial effect arises from the liberation and the increased excretion of salts derived from bone.

AIR IN BILE PASSAGES

According to Samuel Candel and William L. Wolfson, Brooklyn (*Journal* A. M. A., July 20, 1935), biliary fistula into the intestinal canal usually results from the combination of infection and calculi in the biliary passages. Seldom does it develop from a perforating duodenal ulcer. When suppuration of the biliary tracts occur, adhesions form, and the gallbladder or its ducts may become agglutinated to proximate organs; i. e., duodenum, colon, stomach. As a consequence of constant pressure of calculi and advancing necrosis of the wall of the gallbladder, perforation into an adherent viscus may ensue. Internal biliary fistulas have frequently been associated with the presence of stones. The impaction of a stone in the duodenum or small intestine, complicating the perforation of the gallbladder into the digestive tract, may result in intestinal obstruction. Stones that have perforated into the large bowel rarely produce obstruction unless the stone is enormous or unless conglomerated calculi have formed a large mass. The authors report a case of spontaneous cholecystocolonic fistula in which the colon, the fistula, the small gallbladder, the cystic duct, the dilated common duct and the hepatic ducts were air filled and clearly visualized. Roentgenographic studies demonstrated gas and barium shadows in the biliary passage. Persistent cramps and diarrhea were outstanding and significant symptoms. The diagnosis was made preoperatively and confirmed by operation.

HAZARDS OF INDUCTION OF PNEUMOTHORAX in TREATMENT OF LOBAR PNEUMONIA

Jesse G. M. Bullowa and Edgar Mayer, New York (*Journal A. M. A.*, July 20, 1935), believe that there is insufficient evidence to warrant the use of artificial pneumothorax in the treatment of lobar pneumonia except in large hospitals amply equipped for bacteriologic, serologic and roentgenographic studies. Pneumothorax therapy should not be employed by those inexperienced in the treatment of pneumonia or in the use of artificial pneumothorax. The favorable results thus far recorded deal almost entirely with patients in the early stages of the disease and without bacteremia, and in pneumococcic types that otherwise have a low death rate. Prevention of bacteremia in patients has not been demonstrated. The response of dogs to pneumococcus type III is quite different from the response of patients. The use of artificial pneumothorax in pneumonia is still in the experimental stage. Until a sufficiently large number of cases have been studied, general practitioners are not justified in employing it. At least all cases of type I, as well as those of type VII and early cases of type II, should receive serum. In them the hazard of pneumothorax appears unnecessary. Even those advocating this therapy do not recommend it for patients with well established consolidation, patients with bilateral lesions and those appearing for treatment after the third day of the disease.

TREATMENT OF PULMONARY TUBERCULOSIS BY ULTRAVIOLET RADIATION

John S. Coulter and Howard A. Carter, Chicago (*Journal A. M. A.*, July 20, 1935), found that ultraviolet radiation of varied intensity in doses sufficient to produce a mild erythema and subsequent pigmentation produced no beneficial effects in cases of active pulmonary tuberculosis or in cases following thoracoplasty. In cases of thoracoplasty with delayed wound healing, local ultraviolet irradiation with a carbon arc lamp increased the growth of healthy granulation tissue and the tendency to epithelization. Near a large city the changing atmospheric conditions introduce obstacles that make the selection of the dosage factors impossible in heliotherapy. The generally listed dangers following ultraviolet irradiation in cases of pulmonary tuberculosis have been exaggerated, provided the dosage of ultraviolet radiation is carefully regulated. In a number of cases there was no suggestion that ultraviolet irradiation had any uniform effect on the red blood cell count, the hemoglobin value or the white blood cell picture.

ITEMS TO BE REMEMBERED

The *Nassau Medical News* gives the following 20 fundamental points of information that every Doctor should have at his tongue's end.

1. That foundations having a combined endowment of more than $30,000,000.00 are definitely committed to the policy of forcing the establishment of Compulsory Health Insurance under state and federal supervision.

2. That one of the most active of these foundations derives its funds from the profits of the Borden Company.

3. That another of the foundations is the creation of Mr. Edward A. Filene, senior officer of the William Filene's Sons Co. of Boston, department store magnate, whose company owns or controls a chain of department stores which include Abraham

& Strauss of Brooklyn, and Bloomingdale's of New York.

4. That the health insurance legislation being sponsored by those groups in Washington as well as in the state legislatures would make compulsory the participation of fully 85 per cent of the population of our cities, exempting only three groups: (1) farm laborers, (2) those employed in small jobs, having no more than two employees, and (3) "white collar" workers earning more than $60.00 per week.

5. That the entire organization and management of the health insurance machine is to be placed in the hands of political appointees.

6. That the director of this huge organization need not be a physician, and that there is no single office in the main administrative group which must be filled by a physician.

7. That the actual medical work is to be supervised by local, full-time, politically appointed "Medical Managers" whose duties are comparable only to those of the "foreman" in an industrial plant, and who have full charge of all medical matters subject to the highest authority of the State Board.

8. That this political, lay Board holds the power of determining who may and who may not practice medicine among the insured group and that to incur the displeasure of the machine means being permitted to practice only among the perhaps 15 per cent of the population not insured.

9. That this political machine is even given power to borrow money against future revenues and to build hospitals, laboratories, clinics "or other facilities" within their discretion.

10. That if a local office should make arrangements which are not satisfactory to the State Board, the latter may come down to the local territory and take over the entire management itself.

11. That this supreme authority extends even tc the matter of fees so that Nassau County could still be classed as a "rural" community and its doctors be paid the same fees allowed those upstate.

12. That as a matter of fact there need not be any fees at all, but rather a fixed salary or an allowance of so much for each person on the doctor's panel.

13. That the scheme includes provisions for cash benefits for loss of time and for maternity benefits.

14. That the lessons learned by other countries where such plans have been tried are totally disregarded in this proposed legislation and that it embodies all of the very worst of these other experiments.

15. That the administrators, statisticians, investigators, supervisors, clerks, and job holders would total more than the number of physicians engaged in caring for the sick.

16. That the wages of this parasitical group would add at least 50 per cent to the cost of rendering the medical service.

17. That the doctors "on the inside" plus the army of lay workers would constitute a political machine which would hold the "balance of power" in any election and would therefore be self-perpetuating.

18. That the same abuses with which you are now familiar in workmen's compensation and medical care of the indigent, must inevitably be present in this scheme and would be multiplied beyond the power of imagination because almost the entire population would be included in the program.

19. That in no country where such a scheme has been tried has there been a reduction in sickness or death rates but that on the contrary there has always been a definite increase in the time lost from industry, because of sickness, and a definite lowering of the standards of medical care.

20. That there is a very real danger of this effort at regimentation succeeding unless every doctor learns the truth and takes time to tell his patients.

CONCURRENT OSTEOGENIC SARCOMA IN BROTHER AND SISTERS

C. W. Roberts and Charles Purcell Roberts, Atlanta, Ga. (*Journal A. M. A.*, July 20, 1935), report on the spontaneous and concurrent development of bone sarcoma in several members of one family: a brother and two sisters, aged respectively 23, 17 and 13 years. The cases strongly support the hypothesis of a genetic origin or diathesis in the development of malignant tumors. It would appear that a spontaneous susceptibility to autonymous cell growth was resident in the osseous systems of these individuals and perhaps localized to it. Three different major long bones were the sites of origin of the tumors (right tibia, right humerus and lower third of right femur). The appearance of all three sarcomas in a right extremity is perhaps accidental rather than dependent on dextrolateral segregation of the malignant factor during oval division. The contemporary occurrence of the tumors suggests the presence of some adjuvant extraneous factor or factors. The cases indicate that injury was never the primary exciting cause but definitely one of aggravation and acceleration of already existent sarcoma. In the third case there is no history of trauma. In each of the other cases there was a rapidly appearing tumor at the site of injury. The first patient had complained of pain for four months prior to a blow he suffered, while the second patient seems definitely to have sustained a pathologic fracture, indicating the silent growth of intramedullary sarcoma. The author's belief that the fracture did not primarily excite malignant change is strengthened by the fact that the second patient had broken the right clavicle three or four years earlier, when she had fallen down a cliff, and normal healing had resulted. There is nothing here to indicate chronic bone disease as a ground for the superimposition of sarcoma. In the third case the degree of influence of surgical insult at biopsy cannot be estimated, but radiologic study showed rapid etxension of bone destruction subsequent to the diagnostic operation. The constitutional symptoms of the three cases were not sugestive of an infectious process. The authors suggest the possibility of a dietary deficiency factor bearing a primary or aggravating rôle in the development of sarcoma.

Book Reviews

NUTRITION WORK WITH CHILDREN. By Lydia J. Roberts. Revised and Enlarged Edition. Chicago. University of Chicago Press. 1935. Price, $4.00.

This book gives not only a survey of the field of nutrition work with children but also much of the material needed for the success in it. The author brings to the task of writing this work her experience not only as an investigator and as teacher of child nutrition, together with much of first hand knowledge with children themselves.

THE SPLEEN AND RESISTANCE. By David Perla, M. D. and Jessie Marmorston, M. D., with a foreword by Davis Marine, M. D. Baltimore. The Williams & Wilkins Company. 1935. Price $2.00.

In this work the authors set out to answer the important questions as to what effect the spleen has on the curious variations in degrees of resistance and susceptability to infectious diseases.

This careful scientific study includes a critical review of the literature as well as the author's own researches.

OBJECTIVE AND EXPERIMENTAL PSYCHIATRY. By D. Ewen Cameron, M. B. New York. The MacMillan Company. 1935. Price $3.00.

The purpose of this book is to bring together in readily accessible form the natural evolution of a science toward quantitative methods, toward experimentation as the main method of fact findings.

A TEXT-BOOK OF CLINICAL NEUROLOGY. By Israel S. Wechsler, M. D. Third Edition Reset. Philadelphia & London. W. B. Saunders Company. 1935. Price $7.00.

In this edition the subject has been brought up-to-date. The previous edition has been quite thoroughly scrutinized. Many statements which appeared obsolete and others which in the light of newer knowledge seemed of doubtful value have been deleted and several parts of the text have been entirely rewritten.

SURGICAL CLINICS OF NORTH AMERICA. Issued serially, one number every other month. Volume 15, Number 3. Chicago Number—June 1935. 239 pages with 119 illustrations. Per clinic year February 1935 to December 1935. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company, 1935.

The contributors to this number are: Drs. Bettman. Christopher, Compere, Crawford, Danforth, Davis, Ellis, Kreuscher, Magnusen, McWhorter, Rolnick Rosi Speed, Verbrugghen.

THE STORY OF MEDICINE IN TNE MIDDLE AGES. By David Riesman, M. D. Illustrated. Paul B. Hoeber, Inc. New York. 1935. Price $5.00.

This work is intended to fill for the medical student the hiatus between the later Greeks and the moderns and to give to the cultured layman some knowledge of the neglected period known as the middle ages.

Society Proceedings

IOWA AND ILLINOIS CENTRAL DISTRICT MEDICAL ASSOCIATION

The annual meeting of the Iowa and Illinois Central District Medical Association was held at the Outing Club, Davenport, Iowa, Thursday, July 11.

Dr. James Herbert Mitchell, associate professor of dermatology at Rush Medical College, Chicago, Illinois held a skin clinic from two to five thirty in the afternoon.

Dr. Hugh Cabot, professor of Surgery graduate school of medicine of the University of Minnesota and Consulting Surgeon to the Mayo Clinic, delivered an address on "The Historical Background of Prostatic Obstruction."

Dr. H. Winnett Orr, Orthopedic Surgeon of Lincoln, Nebraska, spoke on "The Treatment of Infected Fractures."

The following officers were elected for the ensuing year.

Dr. Howard A. Wells, Davenport, Iowa, President.
Dr. G. D. Hauberg, Moline, Illinois, Vice-President.
Dr. James Dunn, Davenport, Iowa, Secretary.
Dr. F. E. Bollaert, Moline, Illinois, Treasurer.
Dr. J. C. Sluders, Rock Island, Illinois, Censor.
Dr. Edward Shrohbehn, Davenport, Iowa, Censor.

DR. JAMES DUNN, Secy.

Marriages

ALEX J. ARIEFF to Miss Edith Mendelsohn, both of Chicago June 23.

Personals

Dr. Leon Unger was the guest speaker at the meeting of the Kiwanis Club of Harvey, Illinois, on July 23, 1935. The subject of his talk was "Hay Fever."

Dr. Percy H. Swahlen, St. Louis, addressed the Union County Medical Society, May 2, on "The Kidney in Obstetrics."

Dr. James H. Hutton, Chicago, addressed the Peoria City Medical Society, June 18, on "Recent Advances in Endocrine Diagnosis and Treatment."

Dr. Robert W. Keeton, Chicago, addressed the Whiteside County Medical Society, June 27, on "Feeding the Sick in Acute Infections."

Dr. Felix W. Sokolowski, Chicago, has been made managing officer of the Alton State Hospital, succeeding Dr. Dudley T. Dawson, who took a similar position at the Peoria State Hospital.

Earl A. Dennis, Ph. D., assistant in zoology, School of Medicine, Division of Biological Sciences, University of Chicao, has been appointed

assistant professor and head of the department of biology, American University, Washington, D. C.

Dr. Daniel B. Hayden, associate clinical professor of laryngology and otology, Rush Medical College, University of Chicago, has been appointed head of the department of laryngology and otology, effective July 1. Dr. Hayden graduated from Georgetown University School of Medicine in 1904, and has been associated with the Rush Medical College for many years.

The appointment of Dr. Noel Paul Hudson, since 1930 professor of bacteriology, University of Chicago, as professor and chairman of the department of bacteriology at Ohio State University School of Medicine, Columbus, is announced. He succeeds Dr. Charles B. Morrey, who has resigned. Dr. Hudson took with him as assistant professors in the department Floyd S. Markham, Ph. D., Jargen M. Birkeland, Ph. D., and Dr. Oram C. Woolpert, all graduates of the University of Chicago. Dr. Hudson graduated from Harvard Medical School in 1925.

Dr. Allan J. Hruby was reappointed July 17, 1935, by Mayor Edward J. Kelly as a member of the Board of Directors of the Municipal Tuberculosis Sanitarium for a three-year period, beginning July 1, 1935.

Dr. Ralph H. Kuhns, instructor in neuropsychiatry at the University of Illinois, College of Medicine, has been scheduled to speak at the annual convention of the American Congress of Physical Therapy to be held in Kansas City, September 9, on the subject "Fever Therapy in Dementia Paralytica."

News Notes

—A new $100,000 building at the Elgin State Hospital for the Insane collapsed, July 3, injuring seven people. Steel trusses that were being set in the foundation gave way, it was stated.

—One thousand children from 6 months to 2 years of age will have complete physical examinations and mental tests at the Illinois State Fair in Springfield, August 17-24, under a cooperative plan of the Sangamon County medical and dental societies, local hospitals and the state department of health. Arrangements have also been made to give chest examinations, including electrocardiograms, to from 2,000 to 3,000 adults.

—The Illinois State Department of Health will in the future issue diphtheria antitoxin for treatment purposes in vials of 20,000 units. When a larger dose is desired, a multiple number of 20,000 unit vials should be obtained. The department officials believe that deaths have occurred in the past because the dosage has been too small. For prophylactic purposes the department will continue to issue 1,000 unit vials of antitoxin.

—The Chicago Medical Society will hold its annual golf tournament at the Medinah Country Club, August 7. Those eligible to play are the officers, trustees and past presidents of the society, and members of the council and officers of the branch societies. The trophy is a cup named in honor of the late Dr. J. Warren Van der Slice and donated by Dr. Herman L. Kretschmer in 1933. These tournaments were inaugurated in 1932 by Dr. Austin A. Hayden.

—Two Jessie Horton Koessler fellowships of $500 each have been awarded for the year beginning July 1, one to Robert A. Bussabarger, M. S., for work on "Hematological Studies on Gastrectomized Animals" in association with Dr. Andrew C. Ivy at Northwestern University Medical School, and the other to Clayton G. Loosli, Ph. D., for investigation on "Lung Phagocytes in Experimental Pneumonia" under Dr. Oswald H. Robertson in the department of medicine at the University of Chicago.

—The appointment of a committee on infantile paralysis is announced by the Illinois State Department of Health, to coordinate all control activities incident to an outbreak of the disease. With Howard J. Shaughnessy, Ph. D., Springfield, the following physicians make up the committee:

Sidney O. Levinson, Chicago.
Philip Lewin, Chicago.
Paul H. Harmon, Chicago.
George W. Staben, Springfield.
Winston H. Tucker, Springfield.
Lloyd L. Arnold, Chicago.
Frank Garm Norbury, Jacksonville.
Frank J. Jirka, Director of the State Department of Health.

—The Illinois State Department of Health has announced changes in the quarantine regulations, effective at once. Patients with epidemic encephalitis will be isolated for two instead of three weeks and the quarantine period for measles

is reduced to five instead of seven days from the date of appearance of the rash, provided the catarrhal symptoms have cleared up. Hospital patients with communicable disease may not be removed or discharged without the consent of the local or state health authorities; common carriers are forbidden to transport birds of the parrot family without a certificate signed by the state health authority indicating freedom from psittacosis. Quarantine of patients with whooping cough is made more stringent, requiring isolation of all patients for three weeks after the onset of the paroxysmal cough. The modified quarantine, which permitted these patients, identified by special arm bands, the freedom of the home premises, has been rescinded. Scarlet fever patients must always be isolated for a minimum period of 28 days. Release by laboratory tests of specimens has been abandoned as impracticable. Ophthalmia neonatorum must be reported within six hours after detection, according to the new rules.

Deaths

GEORGE H. BRANNON, Manhattan, Ill.; Hospital College of Medicine, Louisville, Ky., 1889; a Fellow, A. M. A.; aged 72; died, May 15, of heart disease.

HERMAN WINFOLD BUNDY, Kankakee, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; a Fellow, A. M. A.; on the staff of St. Mary Hospital; aged 55; was killed, May 19, in an automobile accident.

LOUIS JOSEPH CORDONNIER, Greenville, Ill.; Washington University School of Medicine, St. Louis, 1907; a Fellow, A. M. A.; past president of the Bond County Medical Society; aged 54; died, May 26, of coronary occlusion.

CHARLES D. GARDINER, Grand Tower, Ill.; Hospital College of Medicine, Louisville, Ky., 1877; aged 81; died, May 15, in a hospital at Murphysboro, of injuries received in a automobile accident.

JEROME L. HARRELL, Norris City, Ill.; American Medical College, St. Louis, 1884; member of the Illinois State Medical Society; past president of the White County Medical Society; formerly member of the state legislature; bank president; aged 76; died suddenly, May 23, of chronic myocarditis.

ALONZO RUSSELL JARMAN, White Hall, Ill.; Chicago Medical School, 1922; A Fellow, A. M. A.; past president and secretary of the Greene County Medical Society; proprietor of the White Hall Hospital; aged 41; died, June 26, in the Palmer Sanatorium, Springfield, of pleurisy with effusion.

THOMAS HENRY KELLEY, Chicago; Rush Medical College, Chicago, 1903; a Fellow, A. M. A.; fellow of the American College of Surgeons; on the staffs of the Illinois Central Hospital, Jackson Park Hospital and the South Shore Hospital; aged 53; died suddenly, June 11, in the Sacred Heart Sanitarium, Milwaukee, of coronary sclerosis, angina pectoris and coronary occlusion.

JOHN ARMOUR KIRKPATRICK, Chicago; Hahnemann Medical College and Hospital, Chicago, 1884; aged 81; died, May 29, in St. Luke's Hospital, of hypertrophy of the prostate and chronic myocarditis.

CLARENCE LOEB, Winnetka, Ill.; Marion-Sims College of Medicine, St. Louis, 1899; aged 59; died, May 26, of dilatation of the heart.

ELIZABETH MATTHEWS, Springfield, Ill.; Woman's Medical College, Chicago, 1890; served with the American Red Cross during the World War; aged 73; died, June 9, of cerebral hemorrhage.

FRANK GILLINGHAM MORRILL, Peoria, Ill.; Northwestern University Medical School, Chicago, 1908; a Fellow, A. M. A.; served during the World War; on the staff of St. Francis Hospital; aged 54; died, June 9, of coronary thrombosis.

JOHN GABRIEL O'MALLEY, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1912; member of the Illinois State Medical Society; served during the World War; on the staff of the Columbus Hospital; aged 46; was found dead in bed, May 24, of coronary thrombosis and diabetes mellitus.

JOHN WILLIAM PATTERSON, Oconee, Ill.; College of Physicians and Surgeons of Chicago, 1893; aged 67; died, June 7, of abscess of the middle ear and meningitis.

ISAAC HALE RATHBUN, Spring Valley, Ill.; Rush Medical College, Chicago, 1878; aged 84; died, June 11, of carcinoma of the larynx.

ALFRED EMIL STAPS, Chicago; National Medical University, Chicago, 1898; a Fellow, A. M. A.; Chicago Medical School, 1921; field health officer of the city board of health; aged 64; died, May 30, of arthritis.

GEORGE SWARZ, Chicago; Bennett Medical College, Chicago, 1912; aged 64; died, June 13, in the Michael Reese Hospital, of uremia.

PERCY LOUIS TAYLOR, Springfield, Ill.; Barnes Medical College, St. Louis, 1898; member of the Illinois State Medical Society; aged 61; died, May 24, in St. John's Hospital, of hypertensive arteriosclerosis.

BENJAMIN FRANKLIN URAN, Kankakee, Ill.; Bellevue Hospital Medical College, New York, 1872; member of the Illinois State Medical Society; aged 87; died, June 10, in St. Mary Hospital, of myocarditis.

EUGENE ARTHUR WEST, Chicago; Marquette University School of Medicine, Milwaukee, 1913; member of the Illinois State Medical Society; aged 50; on the staff of the Frances Willard Hospital, where he died, June 18, of pulmonary edema and cerebral hemorrhage.

ASA L. T. WILLIAMS, Vandalia, Ill.; Marion-Sims College of Medicine, St. Louis, 1898; a Fellow, A. M. A.; president and formerly secretary of the Fayette County Medical Society; on the staff of the Mark Greer Hospital; aged 64; was found dead, June 13.

st, 1933

Hospital
uddenly,
waukee,
coronary

nnemann
ged 81;
ertrophy

ms Col-
ed, May

Woman's
Ameri-
3; died,

North-
, 1908;
d War;
4; died,

f Physi-
dicine of
Illinois
ld War;
46; was
osis and

llege of
ged 67;
eningitis.
.; Rush
June 11,

Medical
A.; Chi-
r of the
of arth-

College,
Michael

es Med-
Illinois
4, in St.
s.
; Belle-
2; mem-
ged 87;
rditis.
tte Uni-
member
; on the
he died,
hemor-

ion-Sims
y, A. M.
Fayette
e Mark
ne 13.